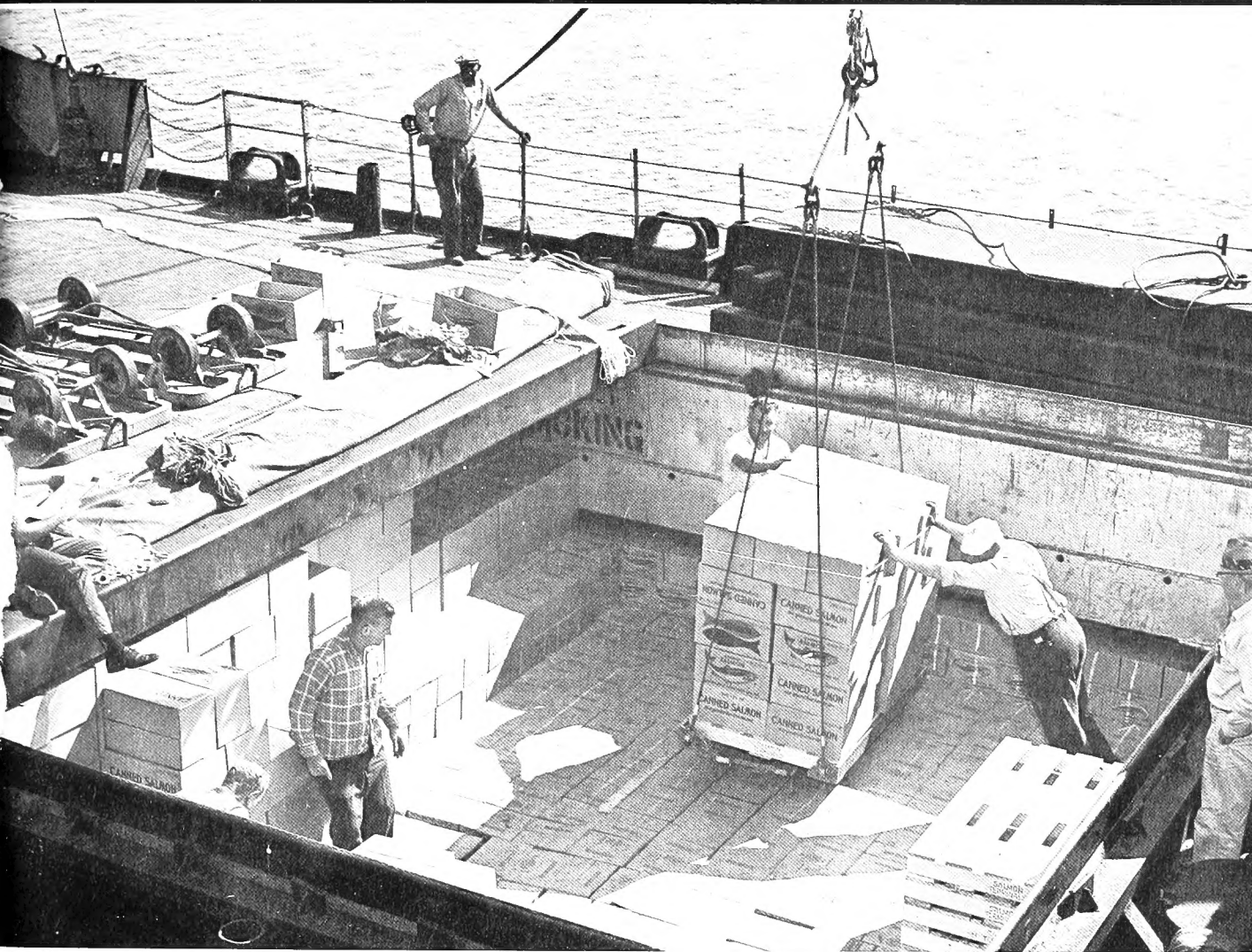




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A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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SHELLFISH HATCHERIES AND THEIR FUTURE

By Victor L. Loosanoff* and Harry C. Davis**

BACKGROUND

In our opinion (one which is shared by many of our professional colleagues and shellfish growers) we are now on the threshold of a new era in shellfish culture in the United States and, probably, the entire world. As is normal, the era of "hunting" came first and is now approaching its end, while a new era of true "farming" is commencing. A similar succession of events has occurred in agriculture, animal husbandry and, to some extent, in fisheries for finfish, where hatchery practices are now recognized and widely accepted.

Even in the days of the Romans, long before eggs and spermatozoa of mollusks had become familiar entities to the biologist, various ideas of artificial cultivation of mollusks, such as oysters, clams, and mussels, were entertained. It was not until about the middle of the last century, however, that the first but, unfortunately, unsuccessful attempts were made in Europe to fertilize oyster eggs and grow larvae artificially. In this country a number of capable biologists, including Brooks, Ryder, and Winslow, also tried to carry fertilized eggs of our oyster, Crassostrea virginica, to setting (metamorphosis), but failed.

In the early Twenties of this century, both Prytherch and Wells succeeded in rearing larvae of oysters and some other bivalves. Unfortunately, their results could not be satisfactorily repeated by other investigators and, in general, the situation continued to be no better than at the time of Brooks and Winslow. This is well demonstrated by several examples, including that of Yoshida who, as recently as 1953, in his attempt to identify and describe larvae of Japanese bivalves, had to catch these larvae in the ocean and then try to grow them to metamorphosis, a difficult and rather uncertain and unreliable method.

The question naturally arises: What were the reasons which, until recently, were responsible for the failure to rear bivalve larvae from fertilization through metamorphosis? We can name three of the most important ones: poor facilities for handling eggs and larvae, lack of proper food and, finally, mortalities caused by fungi, bacteria, protozoa and, probably, even viruses. Because of these reasons only a very few fortunate investigators, including Prytherch and Wells, neither of whom fed their larvae nor even suspected the existence of larval diseases (to say nothing of their control), succeeded in growing these delicate organisms.

Our early efforts to rear bivalve larvae, commenced in the middle Forties, were met with a great deal of skepticism and in some cases almost open hostility, principally because it was believed that these efforts represented a waste of time. The first breakthrough was made in 1944, when we discovered a method of conditioning and inducing spawning of bivalves in the late fall, winter, and early spring. This method gave biologists, who work in such cold climates (New England) as ours, where mollusks and other invertebrates propagate only during the short summer period, the opportunity to work with eggs and larvae of bivalves

* Now Senior Scientist, Shellfisheries Laboratory, Tiburon, Calif., former Laboratory Director, Biological Laboratory, Milford, Conn.

** Asst. Laboratory Director, Biological Laboratory, U. S. Bureau of Commercial Fisheries, Milford, Conn.

Note: This article deals with the general aspects of shellfish hatcheries and their future. The list of references at the end of the article will be useful to those seeking additional details.

regardless of the season (fig. 1). As a result of this discovery and other developments in the technique of raising larvae, sufficient progress has been made during the last 17 years in perfecting practical methods of artificial cultivation of larval and juvenile bivalve mollusks, and it is now apparent that these methods may lead to the general use of hatcheries on which the future shellfish industry will be founded.



Fig. 1 - Inducing spawning in clams and oysters under laboratory conditions. Methods recently developed at Milford Biological Laboratory of the U. S. Bureau of Commercial Fisheries enable biologists to obtain ripe eggs of several species of commercial mollusks throughout the year.

THE NEED FOR AND ADVANTAGES OF HATCHERIES

Before referring to shellfish hatcheries and their future role we should, naturally, offer convincing reasons why these hatcheries are needed. It may also be of interest to decide whether hatcheries will be of help to certain areas only or will benefit fisheries for shellfish in general. A quick glance at the changes that have recently occurred in areas of natural propagation of oysters will show that many of them, especially in certain parts of the country, as Connecticut and New York, no longer exist. Their place has been taken either by yacht clubs and marinas or the bottom material from those areas has been dredged to build roads or provide fill for housing developments. With the disappearance of these ecological entities, which are almost impossible to re-establish artificially, areas of natural propagation also have disappeared, thus leaving shellfish industries without spawning beds and zones of warmer water where abundant phytoplankton of proper quality was available for rapid growth of larvae. Naturally, since nature can no longer provide sufficient seed, artificial methods must be employed to assure a supply of seed oysters and clams.

It is true that these conditions are not found at present in all parts of the country. In some areas, especially the least populated, the situation is somewhat better and may continue to be satisfactory for a few decades. However, considering the so-called population explosion, development of shore lines and, probably, a proportional increase in

pollution, we anticipate that eventually the shortage of seed producing areas may become a general phenomenon.

Another, and extremely strong argument in favor of shellfish hatcheries is that by using them we may, in some instances, do better than nature itself. In other words, instead of depending upon nature to supply us with seed of a quality that we cannot control, hatcheries may provide the industries with oyster or clam seed of known, desirable characteristics. For example, by selecting certain individuals for breeding purposes, it may be possible to develop disease-resistant races of shellfish. Imagine what it would mean to the oyster industries of New Jersey, Delaware, and Virginia today if 15 or 25 years ago we had been able to breed oysters that were immune to the disease which, at present, is causing the industries of those states losses of millions of bushels of oysters.

Secondly, again by proper selection, the hatchery would develop fast-growing races of bivalves. The same may be said in relation to fatness of meats. Furthermore, special

ances of commercial mollusks can be developed that may be planted and grown in areas of low salinities or low temperatures where, at present, their existence is impossible. The first steps in these studies have already been taken at Milford Biological Laboratory (fig. 2) of the U. S. Bureau of Commercial Fisheries.

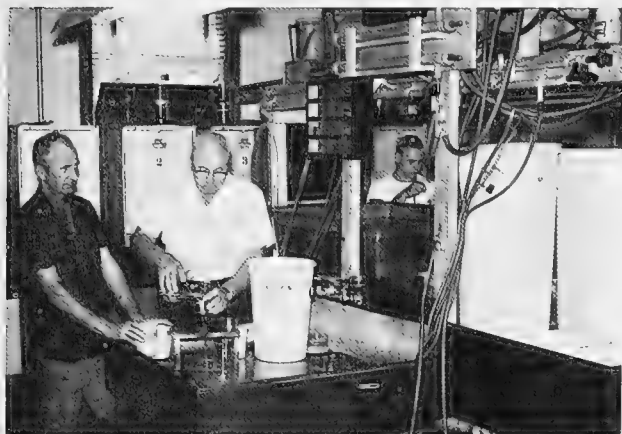


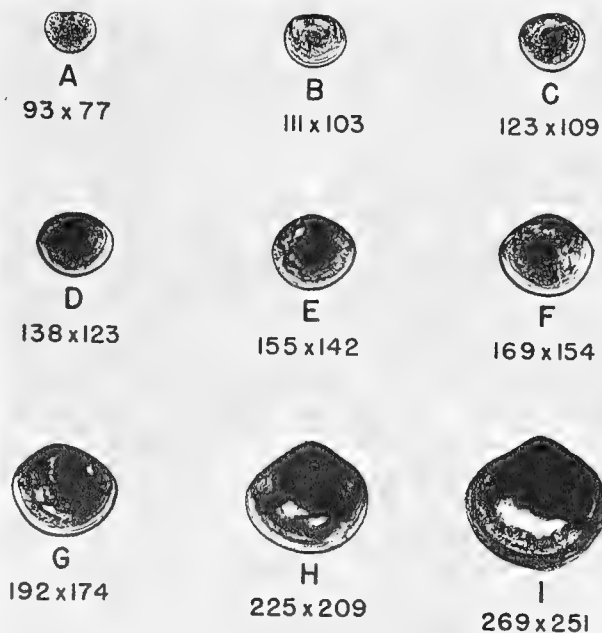
Fig. 2 - Biologists studying physiological requirements of larvae of oysters and clams under hatchery conditions. These studies have already provided extensive knowledge concerning requirements of larval and juvenile mollusks in respect to temperature, salinity, quality and quantity of food, and control of diseases.

There are several other important advantages to having hatcheries as an integral part of shellfish farming. For example, because of the new methods developed at the Milford Laboratory it is now possible to maintain ripe spawners throughout the year. Due to this development small oysters or clams hatched from spawn obtained in the winter can be planted outdoors as soon as the water becomes sufficiently warm for them to grow. This period of extra growth during their first season may reduce by one year the time required for clams or oysters to reach marketable size (fig. 3).

Knowledge and use of the proper techniques in hatchery operations are, no doubt, of considerable importance. Nevertheless, this segment of hatchery activities offers the greatest flexibility and opportunity for experimentation. For example, in some instances where only limited space and a limited amount of water are available for rearing, the larvae can be crowded as dense as 50 individuals per cubic centimeter of water, provided that they are given sufficient supplementary food. In our pilot hatchery we may grow to setting approximately a million clam larvae per square foot of table space every 15 days. In other cases, however, as practiced by Professor Imai of Japan and some oystermen in this country,

Since production in hatcheries can be foretold, a predictable supply of seed oysters and clams can be grown to meet the requirements of individual oystermen or, in certain situations, of the entire shellfish-producing region. This, of course, is an extremely important consideration from the point of view of good management. At present, the Connecticut oyster industry spends thousands of dollars in planting shells on the bottom of Long Island Sound without any assurance that setting will occur and, if so, how heavy it will be.

Shellfish hatcheries can be located in any area where the water supply is good enough for rearing larvae. Testing of the water, to determine whether it is good for hatchery purposes, is a relatively simple and inexpensive process and we have done it in many instances on the request of our friends in the shellfish industries.



MYA ARENARIA X 112

Fig. 3 - Different stages of growth of larvae of soft-shell clam, *Mya arenaria*, from early straight hinge stage (A) to stage at which metamorphosis occurs (H). The last photograph (I) shows a recently-metamorphosed individual. These larvae were grown from spawn obtained from parent clams conditioned early in the spring when clams in nature were still unripe and unable to spawn. Measurements are in microns.

the concentration of larvae may be only one individual per 1.0 cc. of sea water. Under those conditions there may be enough natural food in the water to take care of the food requirements of the larvae and, therefore, no supplementary food is needed.

Between the two extremes indicated above several variations are possible. For example, cultures may be started in a relatively small quantity of water but each time the water is changed, a step taken every day or every second day, its quantity is doubled. This increase in volume of water compensates for the increase in size of larvae and in their food requirements. Therefore, by the time the larvae reach setting size the volume of water in which they are kept may be a hundred times larger than at the beginning.

FOOD FOR BIVALVE LARVAE

Because growing of algal food for larval and juvenile mollusks would present a number of difficulties to hatchery operators, we began to seek easier means of obtaining a food supply. Approximately 25 years ago we used pulverized dried algae, *Ulva* and *Laminaria*, in experiments on feeding of adult oysters. Recently we decided to try using the same material to feed oyster and clam larvae. This material proved to be unsatisfactory as food for oyster larvae, but clam larvae were grown to metamorphosis. However, several difficulties were encountered in connection with the use of this preparation. One of them was that the particles of ground algae quickly settled on the bottom where they soon decomposed creating rich bacterial flora which unfavorably affected the larvae. Fortunately, at least in the case of clam larvae, some of the difficulties were overcome by using a small unicellular alga, *Scenedesmus obliquus*, which we received from Dr. Hiroshi Nakamura of Japan. We gave this material to our associate, Herbert Hidu, suggesting a series of critical experiments, and he has been able to grow larvae of *Mercenaria mercenaria* almost as well as when they are fed our best live food organisms, some reaching metamorphosis in 10 days at 24° C. (75.2° F.).

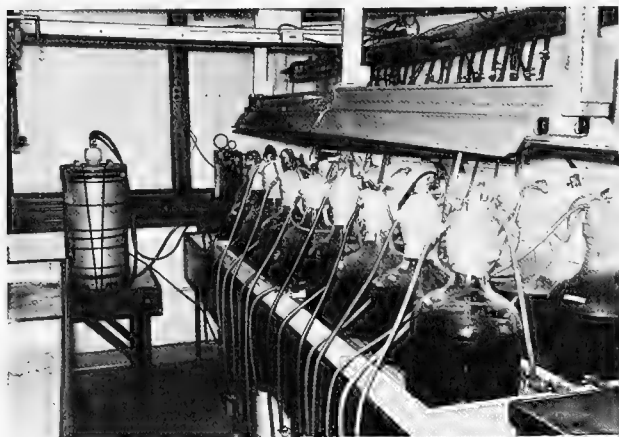


Fig. 4 - Mass cultivation of pure strains of microscopic algae for feeding larval and juvenile mollusks. Food values of different algal cultures are ascertained by a series of critical experiments, and the best species of algae are selected for feeding. Some algae have been dried and successfully fed to bivalve larvae.

So far, we have not been too successful in growing oyster larvae on dried algae even when such good food organisms as *Isochrysis galbana* and *Monochrysis lutheri* were used. We think, however, that this failure is due not to the foods themselves, but to certain complications that arise in connection with their use which, we hope, can be overcome. Since Hidu will report the results of his studies in the near future, we will not go into the details of this problem. However, we have many reasons to believe that within a short time means will be found to supply hatchery operators with ready-to-use food, the cost of which will be low enough for practical use (fig. 4).

WATER TEMPERATURES FOR GROWING BIVALVE LARVAE

The newly-acquired skill in growing larvae at will offers an opportunity to determine the water temperature ranges within which development of eggs and growth of larvae of different species are possible and, also, to ascertain the optimal temperature for hatchery cultivation of larvae of different bivalves. In determining the temperature limits for development of eggs of the American oyster we found that at 15° C. (59° F.) none of the eggs developed normally, although larvae will survive at that temperature without showing appreciable growth for several days. However, within the range extending from 17.5° C. to 30° C. (63.5° F. to 86.0° F.) virtually all fertilized eggs developed to normal straight hinge larvae. At 33° C.

(91.4 F.), nevertheless, only about 45 percent of the eggs reached that stage. Provided with good food, such as naked flagellates, oyster larvae kept at about 30° C. (86.0° F.) begin to set within 8 to 12 days.

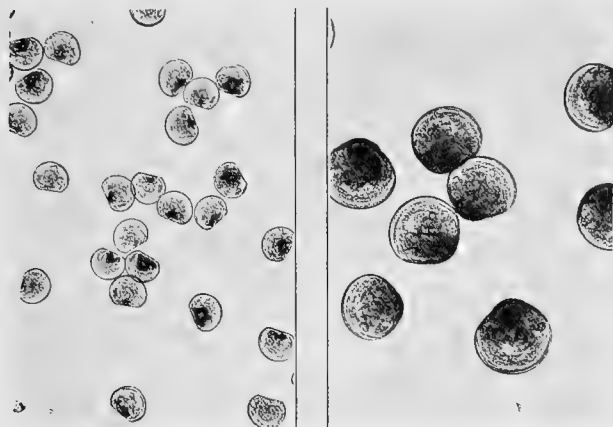


Fig. 5 - Growth of larvae of hard-shell clams, *M. mercenaria*, kept at different temperatures. Larvae in photograph at left were grown at room temperature, until they developed shells, and then placed in water of 10° C. (50° F.), where they survived for 10 days but showed no growth. Larvae kept at that temperature could ingest food but were apparently unable to assimilate it. Larvae in photograph at right were kept at 30° C. (86° F.) and some began to set after 7 days.

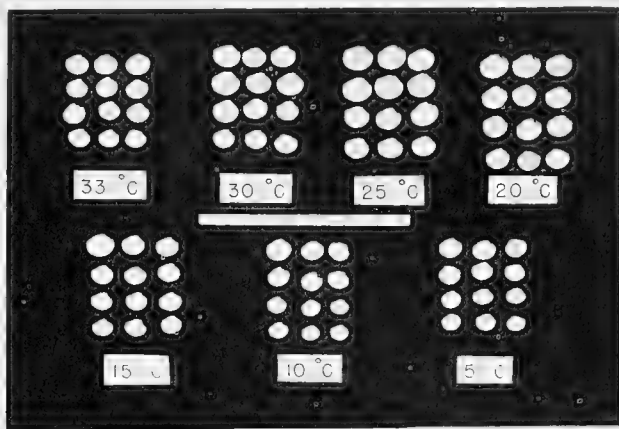


Fig. 6 - Growth of juvenile clams, *M. mercenaria*, at different temperatures. Initial size of all 7 groups was approximately the same as that of the group shown at 5° C. (41.0° F.). At the end of the experiment, which continued for 1 month, no growth was shown by clams kept at 5° C. (41.0° F.) or 10° C. (50° F.) and virtually no growth occurred among clams exposed to 15° C. (59° F.). Most rapid growth was at about 25° C. (77° F.), but at 30° C. (86° F.) clams grew almost equally as well as at 25° C. However, at 33° C. (91.4° F.) rate of growth of young clams was markedly decreased.

Larvae of the hard shell clam, *M. mercenaria*, may develop from eggs within the temperature range of 18° C. to 30° C. (64.4° F. to 86.0° F.). When grown at 30° C. they begin to set as early as the seventh day after fertilization (fig. 5). In general, the optimal temperature range for rearing of larvae, *M. mercenaria*, lies between 25° C. (77° F.) and 30° C. The optimal temperature for the growth of juvenile clams is near 25.0° C. or 77° F. (fig. 6).

We may also add that the temperature at which larvae are grown is an extremely important factor in determining their ability to assimilate different foods. For example, while certain algae, such as *Chlorella*, cannot be digested and assimilated by oyster larvae at relatively low temperatures, such as 20° C. (68° F.), the same algae can be utilized when the temperature is raised to 30° C.

SALINITIES FOR RAISING BIVALVE LARVAE

We can also now recommend to practical oystermen the optimal salinities for raising oyster and clam larvae, as well as indicate the entire salinity range within which these organisms can survive. The best salinity for larvae of Long Island Sound oysters is about 17.5 parts per thousand (p.p.t.). However, good growth was also recorded at a salinity of 15 p.p.t., while at 12.5 p.p.t. it was appreciably slower. Eggs from oysters that came from more brackish water, for example, the upper parts of Chesapeake Bay, developed best in a salinity ranging between 12 and 15 p.p.t., while a salinity of 22.5 p.p.t. was their upper limit. Therefore, variations in optimal salinities for development of eggs and larvae of different geographical races of oysters may be expected but, fortunately, they can be easily predicted or ascertained.

The optimal salinity for development of eggs of hard-shell clams of Long Island Sound is about 27 p.p.t. and no normal larvae develop at 17 p.p.t. or less.

SOME PROBLEMS OF SHELLFISH HATCHERIES

Therefore, even with our presently limited knowledge of the effects of various factors of environment upon development of larvae we can suggest their best combinations and working limits. As we progress in our laboratories, and practical men, in their hatcheries, we will accumulate more and more knowledge applicable to hatchery techniques. We believe, therefore, that within a few years we will not only reach the level of efficiency of finfish hatcheries, but will even excel it.

Even before we learned how to feed larval and juvenile mollusks or determined their optimal temperatures and salinities we discovered that they, as well as chickens, ducklings, or any other living organisms, are subjected to a number of diseases. In our early experiences unexplained mass mortalities decimated or entirely exterminated larvae and juveniles in the cultures. At first the situation appeared hopeless, but gradually we discovered that these mortalities were caused by microorganisms, such as fungi, protozoa, bacteria and, perhaps, viruses. The general situation, therefore, closely resembles that existing in fish hatcheries, where at present mass mortalities often occur even though fish culture preceded shellfish culture by almost 100 years. Again, by persistent experimentation Milford biologists found that many disease-causing microorganisms can be controlled by antibiotics, sulfa drugs, certain chemical preparations, such as PVP-Iodine and dichlorophene, and certain physical methods, such as the use of fine filters and ultraviolet rays. In some cases a mere increase of the water temperature by 1 or 2 degrees above that tolerated by pathogens, such as fungi, but still within the zone of larval endurance may help eliminate the disease-causing organisms. Thus, even at this early stage of our studies, we are prepared to offer to hatchery operators a number of practical suggestions, for control of larval diseases.

Recently our associates isolated several bacteria which caused mass mortalities of bivalve larvae. These studies are only in their infancy but, nevertheless, we have already learned a great deal about the killing power of one of these pathogens. If introduced into a healthy culture of larvae, it kills the entire population within 10 to 12 hours. This organism is not specific, i. e. it attacks many species of bivalve larvae and juveniles, and even larvae of gastropods. We do not want to go into a more detailed discussion of this work because, in the near future, biologists who conduct this work will present their own comprehensive account of their studies. Here we want to add, however, that parallel with the discovery and identification of the microorganisms, we are attempting to develop methods for their control.

Still another problem to be met in hatcheries is control of invertebrates which compete for space, food, etc. with larval or juvenile mollusks. There are many of these organisms, ranging from protozoans to such familiar forms as barnacles, tunicates, and mussels. Fortunately, we have also made considerable progress in this field by developing a number of simple methods by which we can destroy competing organisms without injuring young oysters or clams. Again, this is not the time to go into the details of these methods. Many of them have already been described and references are available. It is sufficient to mention that most of these methods are of chemical nature and are based on the use of a variety of compounds, including common salt, Victoria Blue, many insecticides especially useful in the case of undesirable arthropods, and the recently developed compound PVP-I, which is remarkably effective in controlling some fouling hydroids and protozoa, such as Vorticella, and certain predatory ciliates. It is also possible that this and similar compounds may be effective in protecting bivalves of all ages against such forms as certain bacteria and viruses. We are undertaking studies to ascertain these possibilities.

Thus, step by step, a new vista in mariculture has opened, and our efforts, as well as those of some of our collaborators and colleagues in other countries, are paying dividends. During the last few years our laboratory staff has grown from eggs, millions of seed clams and oysters and sent them to biologists in different parts of the United States and foreign countries. Milford clams have done well in Scotland, England, France, Holland, and Japan, and virtually in every state of this country bordering the ocean. Perhaps the most striking success in growing clams has been achieved in some areas of Florida where, in some cases, seed clams grown by Dr. R. Winston Menzel reached commercial size during their second year of growth.

SUMMARY OF PRESENT KNOWLEDGE

To summarize the present knowledge that may help operators of shellfish hatcheries we may state that:

1. Methods have been developed by means of which certain commercial species of mollusks can be ripened and induced to spawn on a year-round basis.
2. Simple but effective methods have been developed by which eggs and, later, larvae can be effectively reared even under crowded hatchery conditions.
3. Means have been developed for providing good live food for larval and juvenile mollusks. Considerable progress has also been made to provide hatcheries with prepared, easy to store and use food, such as dried algae.
4. A great deal has been learned about ecological conditions, including optimal temperatures and salinities at which eggs and larvae of several commercial species can be reared.
5. Knowledge has been gained about diseases of larval and juvenile mollusks, and how to prevent and control those diseases.
6. Simple and cheap but effective methods have been developed to control many enemies and competitors of hatchery mollusks.
7. The principles of genetics in rearing bivalve mollusks have been successfully employed.

As the summary indicates, we now possess considerable knowledge in the art of artificial cultivation of bivalves. Many people are interested in our progress and, naturally, we like to share our knowledge with them. Many biologists and practical men have been trained at our laboratory in the methods of cultivation of bivalve larvae, or have spent some time learning our techniques.

We believe that because now there are so many men who are able to rear larvae and juveniles we shall, by combining our efforts, progress much more rapidly than previously. Moreover, we may be certain that the art of raising bivalves will not be lost.

THE FUTURE OF SHELLFISH HATCHERIES

As can be expected, the entire matter of artificial rearing of bivalves and operating of shellfish hatcheries was oversimplified by people who were not aware of the difficulties involved. Some believed, or claimed, that to operate a shellfish hatchery required virtually no effort and that anyone who engaged in this enterprise earlier than others would soon become a millionaire. This, naturally, is not a realistic or reasonable approach. There are still many difficulties to be encountered and failures anticipated. This is why we openly admit that our responsibilities are not terminated at this point but, on the contrary, we should continue our research and, if possible, expand it. Nevertheless, we believe that since the principles of the method of raising larvae under hatchery conditions have already been developed, one of our chief efforts, in addition to carrying on basic biological studies, should be directed to perfecting the hatchery techniques for mass production. What steps can be suggested at present that would lead in this direction?

To choose a good location for a hatchery is extremely important. This consists of finding a place relatively free of industrial and domestic pollution and where water contains large quantities of phytoplankton which can be utilized as food by larvae and juveniles. Such locations can probably be found in every shellfish-producing state, nevertheless, a location should be selected only after a careful bioassay of the water.

Genetics should be one of our tools. A hatchery does not need to keep hundreds of bushels of spawners because even a large one can obtain sufficient spawn from a comparatively small number of clams or oysters. These few mollusks, however, must be selected according to their characteristics which, as we have already mentioned, may include rapid growth, good meat, good shape of shells and, perhaps, a certain flavor.

A hatchery may often maintain several stocks of spawners to produce different types of seed mollusks especially adapted to the needs of shellfish farmers in different geographical areas populated by physiologically-different races of mollusks. This is an extremely important consideration because, as we have learned, some of the races that do well in their native environment grow relatively poorly when transplanted to other waters.

Production of set, especially that of oysters, still continues to present a number of technical problems when the operations are conducted on a large scale. In comparatively small-scale operations, as encountered in the laboratory, larvae are grown in heavy concentrations until setting time, when washed oyster shells are placed, as cultch, in culture vessels. Operations on such a scale, however, are, obviously, inadequate for commercial hatcheries. One method applicable to larger operations consists in placing fertilized eggs in large tanks where, without change of water or addition of supplementary food, the larvae can be expected eventually to reach setting stage. This is probably the simplest and oldest method tried in this country and abroad. However, it is also the most unreliable, chiefly because of the impossibility of controlling conditions which may lead to heavy mortality of larvae.

Another, and more effective method consists of raising larvae in smaller vessels at a comparatively high temperature and using good food. Under those conditions larvae can be grown in heavy concentrations at a rapid rate and without serious mortalities. When the larvae are ready to set they are released in larger tanks in which special spat collectors are placed. We have employed this method with considerable success.

A modification of this method may consist of using a long narrow tank into which ready-to-set larvae are released. After the release of mature larvae special collectors of non-toxic material would be slowly moved through the tank at a speed so controlled that by the time a collector passes through the entire length of the tank it would gather a sufficient number of spat per shell. Operations of this type should be supervised by an experienced person who could increase or decrease the speed at which the collectors are moving. The next step would be to mechanize the transfer of spat collectors into special growing tanks, or into natural bodies of water, such as small harbors or bays, where collectors with recently set oysters could be suspended. This is a promising approach, provided that we succeed in developing effective means of preventing fouling of collectors by tunicates, barnacles, hydroids, and other undesirable forms.

To discuss more fully the development of artificial oyster set collectors we may add that we hope to find materials into which we can incorporate substances attractive to oyster larvae, and those that will repel undesirable forms, including many fouling organisms and flatworms, Stylochus inimicus. The recent work of one of our associates, to whom we suggested the incorporation of ejecta of adult oysters into materials from which collectors were made, demonstrated that oyster larvae are attracted to those collectors. If the active attractant can be isolated and identified, it can probably be synthetically produced and incorporated in required quantities in the materials from which collectors are made.

We have already shown that oyster shells treated with chlorinated benzenes not only attract oyster larvae, to some extent, but also simultaneously repel barnacles and Crepidula.

Because of the ease of communication and since it now takes only a few hours to fly from New England to Florida, several new approaches will be possible in the production and, especially, distribution of seed clams and oysters. For example, it may be of advantage in some cases to grow seed clams in a hatchery in the Long Island Sound region and, after they reach a certain size, air-freight them for planting in Florida waters, where they may reach marketable size within a year. Conversely, it might be practical in other instances to locate

the hatchery in southern waters for production of seed to be planted in northern waters. Since the parent stock could be selected for the region where the seed is to be planted, it matters little where the hatchery is located.

To expedite the matter hatchery men will commence operations soon after Christmas so that by March or early April the newly grown clams will be large enough to be flown to a warmer climate. Later, they may be transplanted again to northern waters if it is found that under those conditions a better-tasting oyster or clam will be produced.

The development of different kinds of food for hatchery-reared and pond-grown mollusks will constitute another important step in aquatic farming. As already mentioned, we have made some progress in this field; however, our efforts so far have been really of a pioneering nature. We visualize that within a short time varieties of foods will be available to serve different purposes. Some will be used because they promote rapid growth in mollusks. Others will cause a rapid and heavy accumulation of glycogen in molluscan bodies. Still other foods may give special flavors to the meats. Finally, by selecting certain foods we may even be able to produce oysters of desirable color, such as the famous green oysters of Marennes, France.

Persistent and extensive studies of hatchery diseases, parasites, and, especially, predators should be continued. Although considerable success in those fields has been achieved in developing methods of prevention and control of larval diseases, we expect to encounter new epizootics caused by currently unknown organisms, some of which may arise as a result of mutations. Parallel with discoveries of those mortalities, preventive measures and methods of their control will have to be developed.

Since predation is one of the chief problems in taking care of post-hatchery populations, we need effective methods to keep predators in continuous check, yet which will not harm commercial mollusks. Much has already been achieved in this field and we hope that within a short time we can officially offer a series of recommendations regarding this matter. We know, however, that problems of protecting juveniles are not similar for all species. For example, oyster collectors can be suspended to protect them from bottom-dwelling enemies, while juvenile clams must be continually guarded against those forms. Even under hatchery conditions small clams, 1 or 2 millimeters in size, can easily be destroyed by predators, including certain worms. A crab, entering the hatchery in the larval stage, if undiscovered, may later destroy literally thousands of seed clams in a few days. Boring gastropods, some fish, and even birds, including mallards, may cause severe damage. Therefore, protection of recently set mollusks, especially clams, is a continuous and paramount task. We are certain, nevertheless, that even now many of those difficulties can be alleviated by using the methods, especially those of chemical nature, that have been recently developed.

In addition to chemical methods of control of undesirable organisms in open waters it may be feasible to use plastic ponds, which may give us other advantages in protecting growing juveniles. Those ponds are comparatively inexpensive and easy to operate because of the simplicity of controlling the conditions. Their use should play an important role in the future of shellfish farming, including fattening of market size mollusks (fig. 7).

The size that clams and oysters must attain in hatcheries before they can be planted in open waters to obtain maximum yield per unit of effort should be determined. Some of this work is already in progress at our laboratory.



Fig. 7 - Small plastic tanks used in a variety of experiments with larval, juvenile and adult mollusks. Illustration shows biologist placing spat collectors in tank containing approximately 250,000 oyster larvae ready to metamorphose. Second tank in background is covered to prevent an increase in water temperature and food organisms above desired levels.

Another extremely important point in the management of future shellfish hatcheries and farms will be the development of methods, by means of which we can rapidly purify mollusks from contaminated waters, making them absolutely safe for human consumption. Some of this work has already been done in England, Japan and in this country. However, much more must be accomplished before we can claim complete victory in this important field. I believe that we are on the verge of discovering chemical methods which will enable us to purify oysters without affecting their taste or flavor.

Mechanization of hatchery operations will increase their efficiency and make hatchery production of seed mollusks feasible. Eventually, step by step, we will reach the stage where a hatchery, producing millions of seed clams or oysters, can be efficiently operated by a crew of 3 or 4 men. This will be accomplished by developing automatic devices for changing water, feeding of larval and juvenile mollusks, devising mechanical methods for collecting oyster set in hatchery ponds, and mass-transplanting of the set to special floats or other growing areas adjacent to hatcheries. In addition, methods of chemical control of enemies and competitors of young mollusks can also be mechanized so as to be applied automatically. Because each progressive laboratory and hatchery will contribute to the development and improvement of methods, we may be certain that combined efforts will place hatcheries in a position where their operations will become highly efficient and profitable. Meanwhile, let us not underestimate the difficulties that are still facing us.

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FOOD IRRADIATION

Appendix 2 of the published hearings on "Peaceful Uses of Atomic Energy" contained the "Remarks of Congressman Melvin Price Before the Chicago Public Schools Student Science Fair, April 15, 1962, Chicago, Ill." One section referred to "Food Irradiation" as follows:

"The food irradiation program is another important application in the atoms-for-peace program. Our objective here is to utilize the gamma rays coming from radioactive cobalt and certain other radioisotopes to either sterilize or pasteurize food products. Electron accelerators may also be used for certain applications.

"The Army Quartermaster Corps has placed emphasis on the sterilization of foods. Among the assets of this program is the elimination of unwieldy and difficult-to-maintain refrigeration units in the forward battle areas.

"This would have a terrific impact on troop morale and more importantly, would simplify problems of logistical support. Even more far reaching are the implications of this program in underdeveloped countries where famine is an ever-present threat. Food irradiation would simplify the process by which richer countries could furnish food from their surplus pools to the "have-not" nations as the emergency arises.

"The Atomic Energy Commission has embarked on a food pasteurization program. This differs from the Army's sterilization program in that the foods now being studied will not receive as large a radiation dose for pasteurization. The objectives of the AEC program are also quite different in that it is pointed to more commercial applications. Fresh fish, clams, shrimp, fruits, and vegetables are now being laboratory tested for their ultimate commercial marketing. Freshly shucked clams, for example, have had their shelf-life extended about four times the normal span. Here in Chicago many fresh foods not presently available will move more freely into this city because of this marvelous new technique. Local products in turn may be shipped to outlying areas.

"Mobile irradiators may be moved from section to section of the country to be used at the time crops are being harvested. The ultimate benefits of this method may prove extremely valuable in many foreign countries where food spoilage is a critical problem due to lack of transportation.

"This technique will not replace refrigeration, but will serve as a complementary method of food processing."

Note: Excerpt from "Peaceful Uses of Atomic Energy" (Hearing before the Joint Committee on Atomic Energy, Congress of the United States, Eighty-Seventh Congress, 2nd Session, on Peaceful Uses of Atomic Energy, April 10, 1962), Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 45 cents a copy.

MODIFICATIONS OF CHESAPEAKE BAY COMMERCIAL CRAB POT^{1/}

By Peter A. Isaacson*

ABSTRACT

The purpose of this study was to build a more efficient crab pot or one that would be cheaper to construct. Either one would be economically advantageous to commercial fishermen.

The placement of the entrance funnels in the lowest rows of meshes in the pot allowed the crab to enter with the minimum amount of random searching, and the wire partition in the standard commercial crab pot was found to be an effective means of crab retention. A one-way gate as a means of crab retention was found to be as effective as the wire partition but was cheaper and faster to construct.

For each pot initially set out in the fishing season one or more replacements will be required, therefore the one-way gate method of crab retention should receive more consideration.

INTRODUCTION

The purpose of this study was to build a more efficient crab pot or one that would be cheaper to construct. Either one would be economically advantageous to commercial fishermen.

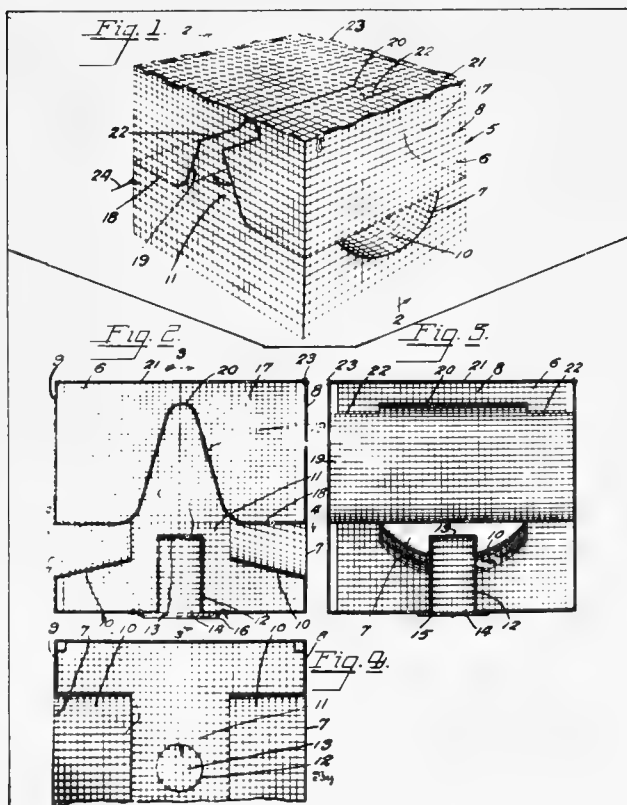


Fig. 1 - Drawings accompanying B. F. Lewis' crab pot (trap) patent, filed September 2, 1937. Fig. 1, External view; Fig. 2, Vertical section through entrance funnels, bait box and partition; Fig. 3, Vertical section, at right angle to Fig. 2, through bait box and partition; Fig. 4, Part of horizontal section top of funnels.

^{1/}Part of thesis research for the degree of Master of Arts at Virginia Institute of Marine Science, Gloucester Point, Va.

*Assistant Research Specialist, Department of Entomology, Cornell University, Ithaca, N. Y.

In 1927 B. F. Lewis began experiments with a behavior-adapted trap for use in the Chesapeake Bay commercial fishery for blue crabs (Wharton 1956). The crab pot patented by Lewis (Lewis 1938) consisted of a rectangular wire cage, separated by a U-shaped wire partition into an upper trap chamber and a lower bait chamber. Entrance funnels in the side of the bait chamber allowed the crabs access to the bait which was contained in a wire cup in the center of the floor (fig. 1).

Lewis observed that the crab entered the pot through a funnel, then seized the food and tried to run with it, and after eating swam upward away from the food.

Lewis' trap did not insure capture, but the U-shaped partition tended to delay the crab's escape.

Until Lewis' pot was perfected in 1938, the trotline method of fishing accounted for more than two-thirds of the Virginia and Maryland commercial hard crab catch. By 1959 the crab pot accounted for two-thirds of the catch (U. S. Fish and Wildlife Service 1961). It was the intent of this study to re-examine the role of the partition and to develop a device that would either delay escape longer or would physically restrain any crab that would enter the pot.

THE APPROACH AND ENTRANCE TO A POT

In the light of observations on crab behavior, the feeding pattern of the crab can be expressed as a sequence of complex events: (1) directed searching--the phase of searching where the animal is responding to stimuli localized in the habitat; (2) food seizure--the action of the crab grasping the food with its chelae; (3) running with the food--the movement of the crab away from the point of first contact with food; (4) eating on bottom--the act of ingestion of food; (5) swimming away--the rapid swimming of the crab away from the food item, which it leaves on the bottom.

To be most effective the crab pot should be built in a manner that would offer the least hindrance to the crab's feeding behavior. The placement of the opening funnels would be a key factor in determining the length of time the crab spends in entering the pot. If an entrance funnel were located close to the point where the crab first encountered the pot, time spent in locating the funnel would be minimized.

MATERIALS AND METHODS: Sixteen crab pots of standard commercial dimensions were constructed. The standard pot is 24 inches long, 24 inches wide, and 20 inches high, and is made of 18-gauge, galvanized $1\frac{1}{2}$ -inch mesh, hexagon netting (fig. 2). An iron rim is tied on the bottom of the pot to weight it.

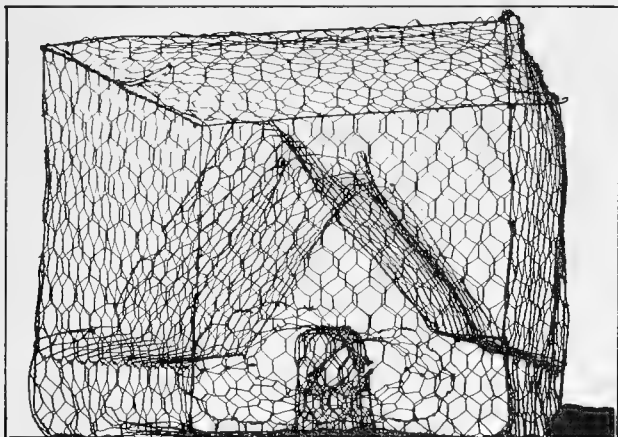


Fig. 2 - Chesapeake Bay crab pot is 24 x 24 x 20 inches, made of double-galvanized, 18-gauge, hexagonal-mesh wire.

The pots were made up in sets of four, each set differing only as to the height from the lower edge of the entrance funnels on the side of the pot.

To eliminate bias due to the depth of the water, bottom type, influence of tides, and diurnal variation in activity of the crab, the pots were placed in a Latin square design (Snedecor 1959). Catch was checked once a day and at that time the pots were rebaited.

The pots were fished for four 2-week periods in the months of May, June, July, and August of 1961. Non-fishing periods were used to repair the pots and to clean them of

fouling organisms. All the fishing was done on the north shore of the York River at Gloucester Point, in front of the Virginia Institute of Marine Science.

OBSERVATIONS: The crab approaches the pot in a crawling, sideways motion, usually pushing all but the swimming legs (which are used in maintaining balance) through the mesh of the pot in an attempt to reach the bait. Some crabs move away from the pots after "investigations" for various lengths of time. Continued search for the opening is a random process, in which the crab works its way around the base of the pot until the opening is found. The crab then crawls through the funnel into the bait chamber of the pot.

A multiple range test (Duncan 1955) for differences in mean catch for the second, third, and fourth fishing periods showed catches by the types of pots with funnels in the lower meshes were significantly larger than those with funnels in the upper meshes. Statistical analysis of data for the first period of fishing was omitted because of the preponderance of zero catches. It is believed that the zero catches were the result of a scarcity of crabs in the fishing area at the time of fishing and not due to malfunctioning fishing gear.

The smaller catches made by the pots with funnels placed at the top are considered to be evidence in support of the observation that the crab most often approaches the pot by crawling, and because of this the pots with the lower-placed funnels proved to be the most effective.

THE FUNCTION OF THE PARTITION

In field trials of the prototype of the modern crab pot, B. F. Lewis observed that the crabs have a tendency to collect in the bait chamber and that after feeding they will attempt to escape by swimming upward through the openings in the inverted U-shaped partition and into the trap chamber. Since then, it has been standard practice to include a wire partition in the pot for the presumed function of making escape from the pot more difficult. The partition is used to capitalize on the crab's response to move upward to the water's surface after feeding.

Observations on the method by which a crab leaves the bait chamber and enters the trap chamber of the pot reveal that there are two ways by which this movement may occur, depending upon the relative position of the crab to the partition at the moment of first contact. If the crab's ventral side makes first contact, the crab will grasp the partition and continue to move at random until an opening is found. However, the dorsal side of the crab may contact the partition first. The crab may then bump the partition repeatedly until an opening is found, but after unsuccessful attempts at passing the barrier it may return to the floor of the pot. Once the crab returns to the floor of the pot, its behavior is not predictable.

This phase of the study was undertaken to determine the role of the wire partition and to see whether other methods of crab retention could be employed.

TESTS: 1. Comparison of standard crab pots with pots lacking partitions: Four standard-size crab pots were used, two with a partition and two without a partition. Five healthy hard-shelled crabs of approximately the same size were placed in each pot. In the standard pot the crabs were placed in the trap chamber. They were large enough so that escape through the mesh was impossible. Active crabs with hard shells were used to lessen the chances of mortality by handling and by natural causes such as cannibalism.

Each crab was marked with a rubber band stretched across the lateral spines. This precaution was taken to distinguish the test crabs from new crabs entering the pots.

The pots remained unbaited and were kept in the water continuously for 13 days. Once each day pots were checked and at that time the remaining animals were replaced by freshly-caught crabs. The numbers of crabs retained by each type of pot were compared using a Chi-square test of independence (Snedecor 1959). The results of the test showed the wire partition to be an important factor in crab retention.

2. Comparison of standard crab pots with pots having markedly inclined funnels and lacking partitions: An attempt was made to make escape more difficult by inclining the entrance funnels more steeply.

Four standard-size crab pots were used, two with a partition and two without a partition but entrance funnels inclined at a 60-degree angle. The pot without a partition did not retain as many crabs as did the standard pot with a partition.

A FUNCTIONAL ESCAPE-PREVENTION DEVICE

Escape might be made impossible if one-way gates were placed over the entrance funnels. Regardless of the behavior patterns of the animal, it would be trapped after it had passed the gate.

Sixteen standard-size crab pots were used. All the pots had funnels placed in the first to third row of meshes from the lower edge of the side of the pot. The pots were made up in sets of four, each differing in the device used for crab retention: Type C had the wire partition which is normally included in the standard commercial pot; Type 20 lacked the wire partition but had a one-way gate of 20-gauge copper wire suspended from the top of the interior edge of each funnel; Type 22 was designed on the same principle as Type 20, but the wire used was 22-gauge Nichrome IV wire; Type 28 was also built like Type 20, but 28-gauge

Chromel A wire with a 0.33 gram weight at the free end was used. Both Nichrome IV and Chromel A contain 80 percent nickel and 20 percent chromium.

The weight of the gate in Types 20 and 28 was the same, but heavier than in Type 22. Different gauges of wire were used to determine if the thickness of the wire or the weight of the gate could have any effect on the efficiency of a pot.

Types 20, 22, and 28 pots with one-way gates are faster and cheaper to construct than Type C, the "standard" pot type.

The sixteen pots were placed in a Latin square design to eliminate bias due to depth of water, bottom type, influence of tides, and diurnal variation in activity of the crabs. The pots were fished continuously for three days. The catch was checked once a day and it was then that the pots were rebaited.

OBSERVATIONS: The analysis of the Latin square design showed that differences in retention are probably due to differences in pot types. By using a multiple-range test for differences in pot means, it was shown that there was no significant difference in the catches of Types 22 and 28 (types with one-way gates) and C (the "standard" pot). The catch of Type 20, with a gate of copper wire, was significantly lower than that of the other three types.

DISCUSSION AND CONCLUSIONS

The placement of the funnel in the lowest rows of meshes in the pot appears to allow the crab to enter with the minimum amount of random searching. This contention is supported by the observation that crabs approach the pot by crawling, and also by the statistical evidence that pots with lower placed funnels had larger catches.

The wire partition in the standard commercial crab pot was found to be an effective means of crab retention, but it did not insure capture and its effectiveness was reached only when the sequence of feeding behavior was completed.

The one-way gate as a means of crab retention was found to be as effective as the wire partition. The gate blocked escape from the pot, but it may have prevented some crabs from entering. Van Engle and Wojcik (personal communication) have tried various types of one-way gates as a means of crab retention but their results have been inconclusive.

Cohen and Dijkgraaf (1960) have demonstrated the presence of three types of sensory receptors in crustaceans: (1) light receptors, (2) chemo-receptors, (3) tactile receptors. Any of these three types of sensory receptors might be used to detect the presence of the gate.

If only chemo-receptors are involved, then Type 28 should not have consistently caught more crabs than Type 22 for their gates were made of the same alloy.

Since the gate with the wire of the finest diameter (in pot Type 28) caught the most crabs, it may be that either light receptors or tactile receptors, or both, are used in the detection of the gate. If tactile receptors are used, then the key factor may be the diameter of the wire and not its weight, for the gates in Types 20 and 28 weighed the same and differed only in the diameter of the wire. At our present state of knowledge the reception of the "gate" stimuli can not be attributed to any single sensory modality. Thus the actual method of reception is open to future investigation.

A one-way gate is as effective as the partition as a means of crab retention and is less costly in labor and material. "The loss of pots from all sources is so great as to require one or more replacements for each pot initially set out" (Van Engle 1962). For these reasons, the use of one-way gates in pots for crab retention should receive more consideration.

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U. S. BUREAU OF SPORT FISHERIES AND WILDLIFE ADOPTS NEW EMBLEM

A new eye-catching emblem (in the form of a shield) has been adopted by the Government agency responsible for Federal wildlife and sport fish activities, the U. S. Department of the Interior announced on November 27, 1962. Motor vehicles, boats, fish hatcheries, wildlife refuges, and other equipment and installations of the Bureau of Sport Fisheries and Wildlife in the Department's Fish and Wildlife Service will be identified by the new emblem.

The shield depicts a marsh scene. Leaping from the water is a fish symbolizing the Bureau's sport fisheries activities. Overhead is the familiar flying goose symbolizing the wildlife work of the Bureau.

Fish and Wildlife Service emblems were first used in Alaska before statehood. At that time, the fish and wildlife resources of the territory were administered by the Fish and Wildlife Service through its Alaska Game Commission. Alaska Game Commission employees were the only service employees then authorized to wear uniforms. The shoulder patch for those uniforms has a typical Alaskan mountain wilderness background with a salmon leaping a falls. Overhead is a flying goose. The new stylized Bureau emblem has evolved from the Alaska Game Commission shoulder patch, which remains standard for all Bureau of Sport Fisheries and Wildlife uniformed employees throughout the United States.



The new Bureau emblem will appear on entrance signs to field stations, on signs marking the boundary of refuges and other landholdings, on bird-banding cards, and on cards notifying pond owners of fish hatchery deliveries.

FISH CONSUMPTION BY FOOD STAMP AND RELATED LOW-INCOME FAMILIES

By Rudolph E. De Pass* and Thomas M. Brooks*

SUMMARY AND CONCLUSIONS

Total consumption of fishery products increased from the April-May to the September-October 1961 survey period among families using food coupons in Detroit, but decreased among similar families in rural Fayette County.

Increases in the consumption of canned fish among families in Detroit accounted for most of the increased use of fish in that area. The added purchasing power of the food coupons appeared to have been the major factor causing this increase in Detroit.

Fewer families using fishery products, plus smaller quantities by users caused the decline in consumption among families using food coupons in rural Fayette County from the spring to the fall survey periods. Seasonal consumption patterns for fish in that area appear to account for the change.

The average retail value per pound of fish--fresh, frozen, and canned--used by most low-income households in both areas during the September-October survey period was higher than the value of that consumed in the April-May period. However, the retail value per pound was the same for the different forms of fish between survey areas.

BACKGROUND AND INTRODUCTION

Data from an experimental pilot Food Stamp Program started in mid-1961 was evaluated to determine the Program's effectiveness in improving diets of needy families and in expanding the demand for food products.

Special household food consumption studies were made of low-income families living in the city of Detroit, Mich., and of rural low-income families in Fayette County, Pa., a bituminous coal mining area. Conditions of chronic unemployment existed in both areas. Information on consumption for a one-week period was obtained both before (April-May 1961) and during (September-October 1961) the operation of the Food Stamp Program. Timing of the studies made possible an evaluation of the effects of the Direct Distribution Program on food consumption of the families not participating in the Food Stamp Program. With the beginning of the Food Stamp Program, the distribution of Federally-donated commodities was discontinued in the pilot areas.

Consumption data were also obtained from low-income families who were ineligible for participation in either public food program but whose incomes were less than \$5,000 per year. Data from those families were used for control purposes to help evaluate seasonal changes in consumption.

The total sample for the study included 1,268 families in Detroit and 837 families in rural Fayette County. These evaluations, however, are based upon foods consumed by matched groups of households or families residing in the same dwelling unit with the same family income (limited changes permitted) during both the Direct Distribution and Food Stamp Program survey periods.

As of February 1962, more than 140,000 food-stamp participants were receiving food coupons in 8 economically depressed areas of the United States. In addition to the two areas mentioned above, pilot Food Stamp Programs are also operating in the following areas:

*Agricultural Economists, Public Programs Section, Economic Research Service, Marketing Economics Division, U. S. Department of Agriculture, Washington, D. C.

Franklin County, Ill.; Floyd County, Ky.; The Virginia-Hibbing-Nashwauk areas in northern Minnesota; Silver Bow County, Mont.; San Miguel County, N. Mex.; and McDowell County, W. Va.

Authorization for expansion of the pilot Food Stamp Program has been announced for the following areas:

Independence County, Ark.	Dickenson, Lee, and Wise
Nash County, N. C.	Counties, Va.
Multnomah County, Ore.	Logan, Mingo, and Wayne
Luzerne County, Pa.	Counties, W. Va.
Jefferson County, Ala.	Vanderburgh County, Ind.
Mendocino County, Calif.	Knott County, Ky.
City of St. Louis, Mo.	Evangeline Parish, La.
Choctaw County, Okla.	Lucas County, Ohio
Grays Harbor and Pacific	Grundy, Hamilton, Marion
Counties, Wash.	and Sequatchie Counties,
Douglas County, Wis.	Tenn.

(The Program is also authorized to be extended to the balance of St. Louis and Itasca Counties, Minn.).

The percentage of food stamp families using fish in both areas during the spring survey period was almost identical to the percentage of all families using fish in the entire United States during the household food consumption survey of 1955 (U. S. Department of Agriculture 1956).

Total fish consumed by all households includes that purchased and received as a gift or pay.

FOOD STAMP FAMILIES

Food stamp families are those households whose incomes were low enough to be classified as needy by local welfare officials. The majority of those families received donated food commodities under the Direct Distribution Program during the spring survey period. During the fall period, food stamp families exchanged the amount of money they would normally be expected to spend on food for food coupons of a higher monetary value.

DETROIT: Per capita increase from the spring to the fall in the consumption of fish by food stamp families in Detroit was attributed largely to an increased use of canned fish (table on following page). More food stamp families served canned fish. Also, members of those families were consuming larger quantities than in the preprogram period. The consumption of canned fish also increased among other low-income families in Detroit; however, the increase was larger among food stamp households. The increases may be attributed primarily to the effects of the Food Stamp Program and secondarily, to seasonal consumption factors.

Generally, the retail value per pound of canned fish consumed by food stamp families during either time period was below that of any of the other household groups surveyed. However, the retail value per pound of canned fish used by most low-income families, food stamp families included, was between 8 and 11 cents a pound above that used in the spring. This shows a shift toward the use of higher-valued canned items, such as canned salmon, by the Detroit families during the fall period.

In both time periods the kinds of canned fish used by most low-income families in Detroit in order of total quantity were: tuna, salmon, and sardines.

Consumption of Fish by Groups of Low-Income Families During a One-Week Period in Detroit, Mich., and Rural Fayette County, Pa., April-May-September-October 1961

Area and Type of Product	Season	Food Stamp Households 1/			Direct Distribution Households 2/			Ineligible Households 3/		
		Families Using	Average Per Capita		Families Using	Average Per Capita		Families Using	Average Per Capita	
		Percent	Quantity Pounds	Value Cents	Percent	Quantity Pounds	Value Cents	Percent	Quantity Pounds	Value Cents
DETROIT:										
Fresh and frozen	spring	43.7	0.28	9	52.9	0.44	16	46.2	0.45	20
	fall	47.1	0.26	12	39.2	0.45	16	35.9	0.37	18
Canned	spring	32.2	0.08	4	28.4	0.08	4	25.6	0.10	6
	fall	49.4	0.20	11	34.3	0.11	7	30.8	0.12	8
Other 4/	spring	1.1	5/	5/	2.0	0.01	5/	2.6	0.02	1
	fall	5.7	0.01	1	1.0	5/	5/	2.6	0.01	1
FISH, TOTAL	spring	62.1	0.36	13	66.7	0.53	20	57.7	0.57	27
	fall	73.6	0.47	24	64.7	0.56	23	59.0	0.50	27
RURAL FAYETTE COUNTY:										
Fresh and frozen	spring	31.4	0.19	6	20.4	0.11	4	44.1	0.20	10
	fall	28.2	0.12	5	16.7	0.08	3	22.5	0.09	4
Canned	spring	24.3	0.06	3	9.3	0.01	1	16.2	0.05	4
	fall	26.8	0.06	3	16.7	0.02	2	18.9	0.06	3
Other 4/	spring	2.9	0.01	1	1.9	0.02	5/	2.7	0.01	1
	fall	0.0	0.00	0	0.0	0.00	0	2.7	0.01	1
FISH, TOTAL	spring	52.9	0.26	10	27.8	0.14	5	55.9	0.26	15
	fall	47.9	0.18	8	31.5	0.10	5	37.8	0.16	8
1/Eighty-two percent of the families in Detroit, and 93 percent in rural Fayette County received donated foods in the spring survey period. In the fall period, these families received food coupons.										
2/Direct Distribution families received donated foods during the spring survey period, but were not participating in either public food program in the fall.										
3/Ineligible families are low-income families who did not participate in either Program during either survey period because their income, though below \$5,000 per year, was too high for participation.										
4/Shellfish, smoked and cured fish.										
5/Less than .005.										

The proportion of the food dollar consumed as fish by food stamp families increased about one percent--from nearly 3 percent in the spring, to about 4 percent in the fall. Rises in the retail value per pound and quantity of canned fish consumed by food stamp households accounted for most of this increased share.

The proportion of fish consumed as fresh and frozen by families using food coupons in Detroit decreased to 55 percent in the fall, from 78 percent in the spring. This decline resulted more from the relative increase in the use of canned fish, rather than from a large decline in the actual quantity of fresh and frozen fish consumed. The decline in the proportion of fresh and frozen fish consumed was smaller among other low-income families than was noted among food stamp households.

The percentage of households in the food stamp family group in Detroit using fresh and frozen fish increased from the spring to fall periods; whereas, all other family groups showed a decline. Although the average retail value of fresh and frozen fish consumed by families using food coupons in Detroit was smaller than the value for other groups, it was only among food stamp households that the value increased during the fall period. These findings indicate that the added purchasing power of the food coupons enabled more families to consume fresh and frozen fish and of a higher retail value per pound.

RURAL FAYETTE COUNTY: In contrast to Detroit food stamp households, the per capita consumption of all fish consumed by families using food coupons in rural Fayette County decreased to less than one-fifth pound in the fall, from approximately one-fourth pound in the spring or by 30 percent. Lower usage rates for fresh and frozen fish accounted for most of this decline. Fewer families served fish in those forms, and family members consumed smaller quantities during the fall period. Except for a relatively large increase in the retail value per pound of fish used by those households, this pattern was quite similar to that of the other household groups surveyed in the rural areas. These changes were similar to the seasonal fish consumption pattern followed by other rural low-income families in Fayette County during the fall season.

Total consumption of canned fish by families using food coupons in rural Fayette County was small and remained constant during both survey periods. The order of importance--in terms of pounds--of canned fish consumed by those families was the same as that for the Detroit families. The percentage of the food dollar spent for fish by rural families using coupons was between 1 and 2 percent of the total food budget in both time periods.

DIRECT DISTRIBUTION FAMILIES

Direct distribution families are also needy households whose diets were supplemented during the spring survey period by Federally donated foods. During the fall period, some of those households did not participate in the Food Stamp Program. Since the Direct Distribution Program is discontinued in areas where Food Stamp Programs are implemented, families choosing not to participate in the latter program are no longer provided with Federally donated foods.

Although the relative use of each form--fresh, frozen and canned--among Detroit direct-distribution households varied between survey periods, total fish consumption was about the same. An increase in the per capita consumption of fresh and frozen fish by users offset a 25-percent decline in the number of families using those forms.

The increased use of canned fish resulted from a slight increase in the number of families serving, and also from larger per capita quantities by the using families. Similar shifts in the consumption of those fishery products by ineligible low-income families indicated that the changes probably resulted from seasonal factors.

Total fish consumed by rural Fayette County direct-distribution households decreased slightly from the spring to the fall survey periods. Fish consumption in those households was considerably less than that consumed by rural food stamp families. Among rural direct distribution households, the total value of all fish consumed was less than one percent of the value of all foods consumed by those households.

INELIGIBLE FAMILIES

Ineligible families are low-income households whose annual income, though less than \$5,000, exceeded the eligibility limits for participation in either the Food Stamp or Direct Distribution Programs during both survey periods. Those families lived in the same area as did those of the food stamp and direct distribution households.

The purpose for studying this group of families was to provide a basis for determining seasonal changes in consumption between the two survey periods. Food consumption by those families was not influenced by either of the two public food distribution programs.

Total consumption of fish by ineligible families in Detroit decreased from the earlier survey period. This decline resulted from a lower per capita use among the using families. Decreases in the total consumption of fresh and frozen fish was mainly responsible for the decline. More families used canned fish in the fall; however, the per capita consumption by the users declined from the spring period.

In rural Fayette County total consumption of fish by ineligible families also declined from the spring period. The decline resulted from fewer families using along with a slight decline in the per capita consumption by the users. Like similar families in Detroit, this decline was caused primarily by a decrease in the consumption of the fresh and frozen forms of fish. Except for canned fish in rural Fayette County, the retail value per pound of all forms of fish used increased from the spring to the fall period.

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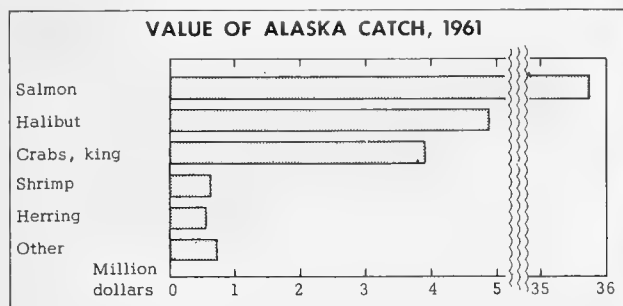


TRENDS AND DEVELOPMENTS

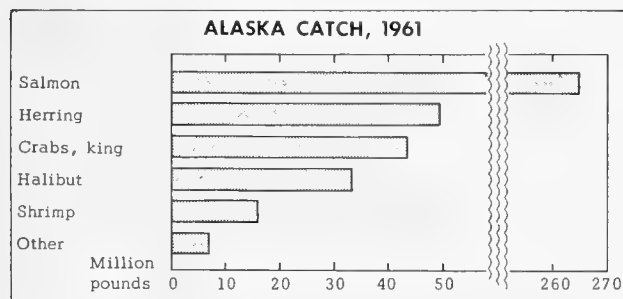
Alaska

FISHERIES LANDINGS, 1961:

The 1961 commercial catch of fishery products in Alaska totaled 414 million pounds valued at \$46.5 million ex-vessel. This was an increase of 55.5 million pounds or 15 per cent in quantity and \$5.5 million or 14 per cent in value as compared with 1960.



The increased landings in 1961 resulted from a 264.8-million-pound catch of salmon--a gain of 57.7 million pounds over the previous year. The catch was the largest since 1956, although far below the record 726.9 million pounds taken in 1936. A new king crab record was established when landings reached 43.4 million pounds--14.8 million pounds above 1960. Catches of halibut (33.4 million pounds round weight) and shrimp (16 million pounds) were up 5 million pounds and 8.5 million pounds, respectively. The total gain would have been even greater had there not been a large decline in the take of sea



herring. Landings of this species (49.5 million pounds) were 28 million pounds less than in 1960 and 58 million pounds lower than in 1959.



Fig. 1 - A deckload of king crabs aboard a vessel fishing off Kodiak Island in February.

The value of the Alaska catch in 1961 was up, largely due to increases in the value of salmon, king crab, and halibut.

There were 15,776 fishermen engaged in Alaska fisheries in 1961--about 1,446 more than in the previous year. The increase took place in the shore and boat fisheries. Commercial fishing craft operated during the year consisted of 2,096 vessels totaling 41,771 gross tons and 6,778 motor boats.

During 1961, there were 157 fishery wholesale and manufacturing establishments in Alaska which gave employment to 8,702 persons. Fishery products produced by those firms were valued at \$128.5 million--about \$31.8 million more than in the pre-



Fig. 2 - Picking red salmon from gill net aboard a vessel in Bristol Bay.

vious year. The gain was due primarily to the increase in production of frozen crab meat, dressed halibut, and canned salmon.



Alaska Fisheries Exploration and Gear Research

DISTRIBUTION OF POTENTIALLY VALUABLE STOCKS OF FISH AND SHELLFISH STUDIED:

M/V "Yaquina" Cruise 62-3 (October 9-November 12, 1962): To determine the extent and approximate distribution of potentially valuable stocks of fish and shellfish in certain southeastern Alaskan waters was the objective of the 5-week exploratory cruise by the U. S. Bureau of Commercial Fisheries chartered vessel *Yaquina*. The area surveyed included Lynn Canal, Chatham Strait, Icy Strait, and Glacier Bay. Shrimp trawls, crab pots, and experimental octopus traps were used during sampling operations.

Depths from 10 to 395 fathoms were sampled in a series of 58 half-hour trawl drags. Shrimp trawls measuring 41 feet and 57 feet were towed from a single wire with a 25-fathom bridle. Six to 9 king crab pots were set at 12 locations at depths ranging from 35 to 100 fathoms. Trials were also carried on with octopus trap gear.



King crab pot being released over the side of the *Yaquina* on cruise 62-3. The mesh is knit from stainless steel wire. The buoy line used is part polypropylene and part nylon.

Information indicating the distribution of various species by depth was recorded. Commercially desirable fish caught during the explorations included rock, flathead, dover and rex soles, arrowtooth flounder, Pacific halibut, Pacific ocean perch, walleye pollock, and sablefish.

Good quantities of shrimp were caught in the Glacier Bay area. Up to 600 pounds of shrimp were caught during 30-minute trawl drags with a 57-foot shrimp trawl. The catches in 17 successful trawl drags in Glacier Bay averaged 56 percent pink shrimp and 35 percent side-stripe shrimp. The best catches of pink shrimp were in depths between 25 and 50 fathoms; side-stripe shrimp were most abundant in drags from 100 to 125 fathoms.

King crabs were caught at the rate of 7 to 26 per crab pot off Eagle River near Juneau. The best fishing depth found at that location was 55 fathoms. Tanner crabs were caught at the rate of up to 49 per pot at 60 fathoms in Berner's Bay.

Although experimental octopus gear was set at 11 locations, no octopi were caught by this method.

Note: See *Commercial Fisheries Review*, December 1962 p. 18.



Alaska Fisheries Investigations

The following is a report of October 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska:

PINK SALMON STUDIES:

Further studies were made of the use of vertebral counts for racial identification of salmon. Using modified staining techniques, biologists studied pink salmon fry collected from Auke Creek during the 1962 spring migration. Analysis of the data has shown a progressive seasonal increase in the variability of vertebral counts, which raises important questions concerning: (1) the effects of environmental changes during the early embryonic stages of the fry, and (2) differential rates of fry development within and between redds in a single spawning area.

The large 1962 pink salmon spawning escapements in Prince William Sound resulted in superimposition of nests in some streams. In such an area in Olsen Creek, there appeared to be a saturation limit of about 3,000 live embryos per square meter of stream gravel. The total use through successive waves of spawning for the season was about 2.5 females per square meter.

* * * * *

RED SALMON STUDIES:

The Karluk research station was closed in early October after a red salmon escapement of 560,000 fish, the largest since 1953 was enumerated. Most of the returning fish were from the 1957 brood and had spent two growing seasons in Karluk Lake. The parent year escapement was about 220,000 salmon.

* * * * *

OCEANOGRAPHY STUDIES:

The Murre II, recently equipped to take limited oceanographic data, completed its first cruise. During the round trip from Juneau to Ketchikan, 5 of 7 scheduled oceanographic stations were occupied. Inclement weather precluded studies and sampling at the other two stations. Samples were taken for determination of salinity, dissolved oxygen, nitrate, phosphate, and silicate. The recently acquired David Miller high-speed plankton samplers were used successfully at all stations. Plankton from Clarence, Sumner, and Chatham Straits areas was much different from that of Auke Bay.



American Fisheries Advisory Committee

INTERIOR SECRETARY APPOINTS FOUR TO COMMITTEE:

The appointment of four new members of the American Fisheries Advisory Committee and the selection of a new executive secretary for the 20-man group was announced on November 22, 1962, by Secretary of the Interior Stewart L. Udall.

New members of the committee, which advises the Secretary of the Interior on commercial fishery problems, are Ammon G. Dunton, White Stone, Va.; J. Roy Duggan, Brunswick, Ga.; Thomas D. McGinnes, Irvington, Va.; and Roy Prewitt, Lonoke, Ark.; Robert D. Balkovic, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C., is executive secretary.

Besides the four new appointees, the American Fisheries Advisory Committee includes Ralph E. Carr, President, Mid-Central Fish Company, Kansas City, Mo.; Harold F. Cary, Assistant to the President, Van Camp Sea Food Company, Long Beach, Calif.; Chris Dahl, Kayler-Dahl Fish Company, Petersburg, Alaska; George J. Davidson, Boston, Mass.; Louis Fischer, Fischer Sea Foods, Cocoa, Fla.; Ray H. Full, President, Kishman Fish Company, Vermilion, Ohio; H.R. Humphreys, Jr., President, Standard Products Company, Inc., White Stone, Va.; Leon S. Kenney, President, Pinellas Seafood Company, St. Petersburg, Fla.; E. Robert Kinney, President, Gorton's of Gloucester, Gloucester, Mass.; John S. McGowan, Vice President, Bumble Bee Seafoods, Inc.; Astoria, Oreg.; James McPhillips, Vice Chairman, Southern Industries Corporation, Mobile, Ala.; John Mehos, Liberty Fish and Oyster Company, Galveston, Tex.; Arthur H. Mendonca, President, F.E. Booth Inc., San Francisco, Calif.; Anthony Nizetich, Manager, Fisherman's Cooperative Association, San Pedro, Calif.; Einar Pedersen, Seattle, Wash.; and Daniel H. Smith, Smith Brothers of Port Washington, Port Washington, Wis.

Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, is the permanent chairman.



California

COMMERCIAL SALMON LANDINGS LOWER IN 1962:

California's commercial landings of salmon for the 1962 season ended September 30 were estimated to be 6 million pounds, announced the California Department of Fish and Game. This was a 30-percent drop from the previous year's landings of 8.6 million pounds. Although the decline was fairly sharp, it was attributed to normal fluctuations in salmon populations.

California's highest commercial salmon catch on record was 10.3 million pounds in 1956. Landings for the past five years were (in million pounds): 8.6 in 1961, 6.2 in 1960, 6.8 in 1959, 3.6 in 1958, and 5.2 in 1957. California's commercial salmon landings have averaged 5 million pounds a year during the 40 years that catch records were kept by the Department of Fish and Game.

Of the total salmon landed during the 1962 season, Eureka accounted for 2.5 million pounds as compared with 1.4 million pounds in 1961. San Francisco was in second place with landings of 1.5 million pounds as against 3.7 million pounds a year earlier.

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CONGRESSMEN REVIEW ANADROMOUS FISH RESOURCES:

The plight of California's salmon and steelhead trout was reviewed during the first week in December 1962 when U. S. Congressmen John Dingell (D. Michigan) and George A. Goodling (R. Pennsylvania) spent two days viewing the salmon and steelhead problem areas of that State with representatives of the California Department of Fish and Game and the U. S. Fish and Wildlife Service.

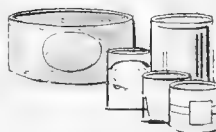
Congressman Dingell is the chairman of the Subcommittee on Fish and Wildlife Conservation of the Committee on Merchant Marine and Fisheries which is concerned with an \$11-million Federal aid proposal for the anadromous fish resources of California.

proposed by California Senator Clair Engle and the late Congressman Clem Miller during the last Congress. (December 1, 1962, press release from California Department of Fish and Game.)



Cans--Shipments for Fishery Products, January-September 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-September 1962 was 7.5 percent above that used during the same period in 1961. The increase was due mainly to an increase of 28.5 percent in combined shipments to the Eastern, Southern, and North Central Areas. The pack of Maine sardines in 1962 was much greater than in 1961 and the 1962 pack of tuna will be a record one.



U. S. Domestic Shipments of Metal Cans for Fishery Products, January-September 1961 and 1962
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter		Jan.-Sept.	
	1962	1961	1962	1961	1962	1961	1962	1961
East 1/	158,531	2/	189,556	2/	341,193	2/	689,280	2/
Southern	13,403	2/	32,668	2/	21,765	2/	67,836	2/
North Central	63	2/	29	2/	22	2/	114	2/
Total 2/	171,997	193,197	222,253	215,510	362,980	180,504	757,230	589,211
West 3/	414,199	335,133	701,831	708,423	562,140	633,374	1,678,170	1,676,930
Total all areas	586,196	528,330	924,084	923,933	925,120	813,878	2,435,400	2,266,141

1/Includes Puerto Rico.

2/The grouping of States by geographic areas for reporting purposes was changed in 1962 so only total shipments in 1961 to the East, Southern, and North Central Areas are shown.

3/Includes Alaska and Hawaii.

California's anadromous fish species, including salmon, steelhead, striped bass, and shad, face grave difficulties today. The spawning areas where those fish are produced have been drastically reduced by dams and water developments in the past. The water developments are continuing at an even greater pace today and the State's efforts to save the fisheries resources in the process of those developments, although intensive, cannot begin to catch up with past losses.

Because of this danger to a multimillion dollar sport and commercial resource, the \$11-million Federal aid program for California's anadromous fish resources was

In January-September 1962, shipments to the Pacific or Western Area accounted for 68.9 percent of total shipments; shipments to the Eastern Area accounted for 28.3 percent; and shipments to the Southern Area accounted for most of the remaining 2.8 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing cans. The data for 1961 cover only shipments of steel (tinplate) cans, but the data for 1962 cover shipments of steel and aluminum cans. It is believed that only a small amount of aluminum is being used in cans for fishery products at present. The tonnage equivalent figure for 1961 data is derived by use of the factor 23.0 base boxes per short ton of steel. The tonnage equivalent figure for 1962 data is derived by use of the factor 21.8 base boxes per short ton of steel. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size.

(2) See Commercial Fisheries Review, Dec. 1962 p. 27, Aug. 1962 pp. 16-17.

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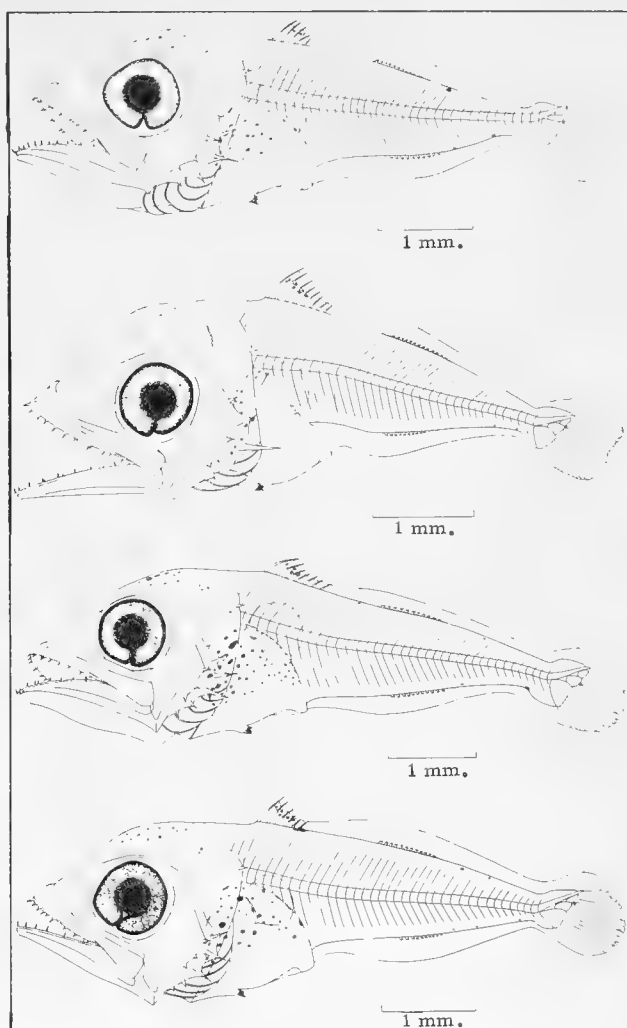
Central Pacific Fisheries Investigations

PROGRESS MADE IN THE IDENTIFICATION OF TUNA LARVAE AND JUVENILES:

The problem of identifying larvae of the various tunas has been actively investigated for a number of years by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu. Notable progress has been made in the past in identifying larvae of *Auxis* sp. (frigate mackerel); *Euthynnus lineatus*, *E. alletteratus*, *E. yaito* (black skipjack or little tunny); *E. pelamis* (skipjack), and *Thunnus albacares* (yellowfin) taken in plankton net hauls. More recently some progress was noted also in the tentative identification of *T. obesus* (big-eyed), *T. alalunga* (albacore), *T. thynnus* (bluefin), and *T. tonggol* (longtail), but the identification was based to some extent on circumstantial evidence. In order to ascertain the accuracy of this identification, it was believed that a more direct approach to the problem was necessary; specifically, by fertilizing the eggs artificially and rearing the larvae past the yolk-sac stage or the stage at which the mouth has become functional.

Because opportunities to collect ripe gonads of both sexes of tuna of the same species simultaneously are rare, and because of a lack of general information on the best way to handle and care for eggs and larvae of marine fishes, it was decided to attempt as a first step, to hatch various unidentified pelagic fish eggs taken in plankton nets and to rear the larvae as long as possible. This was done during the *Charles H. Gilbert* Cruise 60 (September 26-October 12, 1962) in calm water off Kona, Hawaii.

The eggs of a number of fish were carried through hatching, and the hatched larvae were successfully reared through the yolk-sac stage. In common with the experience of other workers, it was found that the eggs could be hatched quite easily in 4-ounce jars or larger, depending on the number of eggs: the fewer the eggs per unit volume of water, the more successful the hatching. An adequate amount of water was found to be quite important to insure survival of the larvae. Changing about one-third the volume of water 3 or 4 times daily materially increased the length of time the larvae could be kept alive. The prompt removal of all dead eggs and larvae increased the survival rate of the remaining larvae.



Larvae of (top to bottom) albacore, big-eyed, Australian northern bluefin, and Pacific bluefin.

During the rearing of the larvae, a feeding experiment was conducted. A very small amount of yeast dissolved in water, 1 drop or less, was fed to a group of larvae which had already developed functional mouths. Another group of larvae of the same species was kept as a control. The group that had been fed remained alive about 2 days longer than those that had not been fed. It was also learned that the time of initiation of feeding may be very critical for survival of the larvae. Whenever food was placed in the aquarium before the functional mouth had formed, the larva died within a day or so, quite possibly as a result of water contamination caused by the unutilized food. Although the results of this single trial are not conclusive, they provide us some

basis for believing that yeast may be an effective food for keeping larval fish alive after the yolk-sac stage.

Related to larval tuna identification is the identification of juveniles approximately 12-200 millimeters (about 0.5-7.9 inches) long. Recently a significant skeletal character for identifying young albacore was investigated. The character referred to is the unique shape and size of the haemal spine of the first caudal vertebra. In albacore part of this spine is flattened laterally over the middle third of the spine.

Numerous observations of adult skeletons of three species of tuna taken commercially in the Central Pacific showed that all 492 albacore examined possessed this odd-shaped spine. In contrast, the corresponding spine of all 337 yellowfin and 251 big-eyed examined appeared "normal" and showed little or no inclination towards flatness or enlargement. Information obtained from other workers, through correspondence, indicates also that the haemal spine of the first caudal vertebra of *T. atlanticus* (blackfin), longtail, and bluefin is not modified like that of albacore. Therefore, it appears that albacore is the only species which possesses this odd-shaped spine.

It is interesting to note that this character can be seen in very young tuna and is therefore useful in identifying juveniles. Recently examination of stomach contents of pelagic fishes at the Laboratory yielded two small juveniles, approximately 62 and 74 millimeters (standard length 2.4-2.9 inches), possessing this modified spine. Although the exact size at which this character develops has not yet been determined, it is fairly certain that it is present in juveniles much smaller than 60 millimeters (2.3 inches).

The ability to recognize this uniquely flattened haemal spine in individuals smaller than 60 millimeters would greatly assist in identifying small albacore and would represent a material advance in the ability to understand the life history of this interesting and important species.

Note: See Commercial Fisheries Review, August 1962 pp. 17-18.

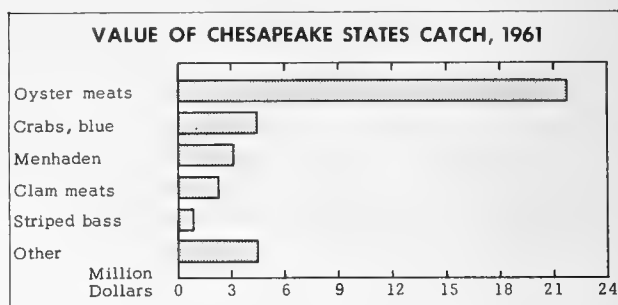


Chesapeake States

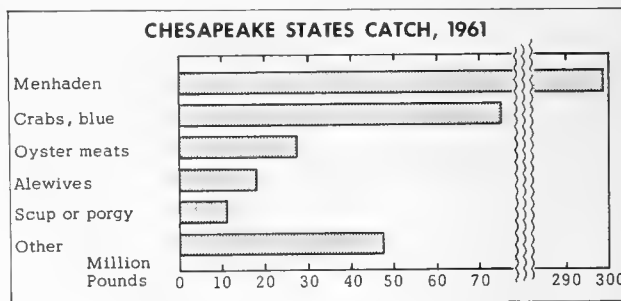
FISHERY LANDINGS, 1961:

During 1961, fish and shellfish landings in the Chesapeake States (Maryland and

Virginia) totaled 478 million pounds valued at \$37 million ex-vessel. This was an increase of 42 million pounds or 10 percent in quantity and \$2.2 million or 6 percent in value as compared with the previous year.



The increase in quantity was largely due to menhaden landings which amounted to 298.7 million pounds--50 million pounds more than in 1960. The catch of hard blue crabs (70.6 million pounds) was the second highest on record, exceeded only by the 73.9 million pounds landed in 1950. Landings of striped bass reached 7.3 million pounds (up 575,000 pounds over 1960) and established a new record. There were also slight increases in the catches of butterfish, shad, sea trout, white perch, and oysters. Moderate decreases occurred in the catches of alewives, croaker, catfish and bullheads, fluke, scup, spot, clams, and sea scallops.



Virginia produced 411 million pounds (86 percent) valued at \$24 million (66 percent) of the total landings in the Chesapeake States. The Maryland and Virginia catch was taken by 18,172 fishermen operating in 1,350 vessels of 5 net tons and over, 9,228 motorboats, and 1,019 other boats.

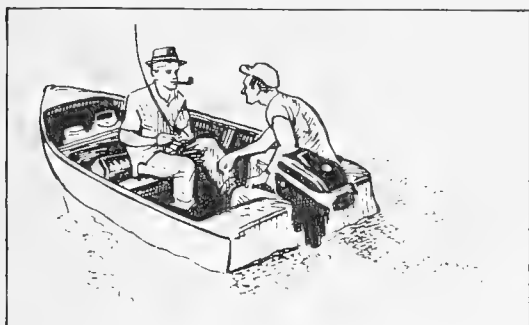
Manufactured fishery products of the Chesapeake States in 1961 were valued at \$58.5 million--an increase of \$3.4 million as compared with the previous year.



Federal Aid for Sport Fish and Wildlife Restoration

FUNDS APPORTIONED TO STATES, FISCAL YEAR 1963:

Distribution of \$7,062,000 in additional funds to various states to provide better hunting and fishing for the Nation's sportsmen was announced on November 21, 1962, by the Secretary of the Interior. The money allocated under the Federal Aid in Fish and Wildlife Restoration programs, brings the total apportioned for the fiscal year ending June 30, 1963, to \$19,170,000.



Funds come from Federal excise taxes on certain types of hunting and fishing equipment. Of the \$19,170,000 apportioned for the year, \$13,646,000 is for wildlife and \$5,524,000 is for sport fisheries work.

The fiscal year's maximum for fish restoration is \$276,200 and the minimum is \$55,240. States receiving the maximum amount are Alaska, California, Minnesota, and Texas. Twelve received the minimum. The Federal Aid in Fish Restoration program started in 1952. The maximum that year was \$128,745, and the minimum was \$25,749.

The territorial areas of Guam, Puerto Rico, and the Virgin Islands each received \$10,000 for their fisheries programs.

Federal Aid money is matched by states on the basis of not to exceed 75 percent Federal to 25 percent state funds. The Federal Aid to Fish and Wildlife Restoration programs are administered by the Department's Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service.

Apportionment for Federal Aid in Sport Fish Restoration, Fiscal Year 1963	
States	Amount (\$)
Alabama	96,066.62
Alaska	276,200.00
Arizona	103,964.92
Arkansas	94,133.12
California	276,200.00
Colorado	126,272.44
Connecticut	55,240.00
Delaware	55,240.00
Florida	126,850.80
Georgia	115,443.76
Hawaii	55,240.00
Idaho	90,342.22
Illinois	147,358.70
Indiana	133,346.72
Iowa	98,936.50
Kansas	98,910.19
Kentucky	76,451.22
Louisiana	55,240.00
Maine	56,334.17
Maryland	55,240.00
Massachusetts	55,240.00
Michigan	209,088.41
Minnesota	276,200.00
Mississippi	73,291.71
Missouri	145,937.81
Montana	128,779.83
Nebraska	80,604.92
Nevada	79,644.52
New Hampshire	55,240.00
New Jersey	55,240.00
New Mexico	97,536.80
New York	148,772.96
North Carolina	87,007.88
North Dakota	55,240.00
Ohio	151,094.00
Oklahoma	115,928.15
Oregon	127,767.22
Pennsylvania	121,977.59
Rhode Island	55,240.00
South Carolina	61,234.99
South Dakota	71,001.65
Tennessee	128,725.24
Texas	276,200.00
Utah	84,865.63
Vermont	55,240.00
Virginia	76,597.23
Washington	103,732.20
West Virginia	55,240.00
Wisconsin	209,699.92
Wyoming	88,619.96
TOTALS	\$5,524,000.00

Note: See Commercial Fisheries Review, February 1962 p. 17.



Federal Purchases of Fishery Products

FISHERY PRODUCTS INCLUDED UNDER SANITARY APPROVAL PREREQUISITES FOR PROCUREMENT:

Fishery products are included in Headquarters Notice No. 134 (61) issued December 20, 1961, by the Defense Subsistence Supply Center (DSSC), Chicago, Ill., on Sanitary Approval Prerequisites for DSSC Procurement.

A later Notice to the Trade (No. 25-62), issued on October 19, 1962, by the Los Angeles Region, announces that effective January 1, 1963, offers submitted by those establishments which do not meet the sanitary approval criteria established by Notice 134 (61), will be declared nonresponsive by that Headquarters. This includes offers submitted by brokers or distributors on "Brand Name" items which did not originate from an approved source.

Headquarters Notice No. 134 (61) of December 20, 1961, stated that effective January 1, 1963, DSSC contracts for products other than those that were excepted, could be awarded only to firms whose establishments met certain criteria. The criteria for fishery products reads: "An establishment processing fish and other waterfoods under the continuous inspection supervision of the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, as officially listed by that service."



Fish Hatcheries

NATIONAL FISH HATCHERIES PRODUCE RECORD QUANTITY OF FISH IN 1961:

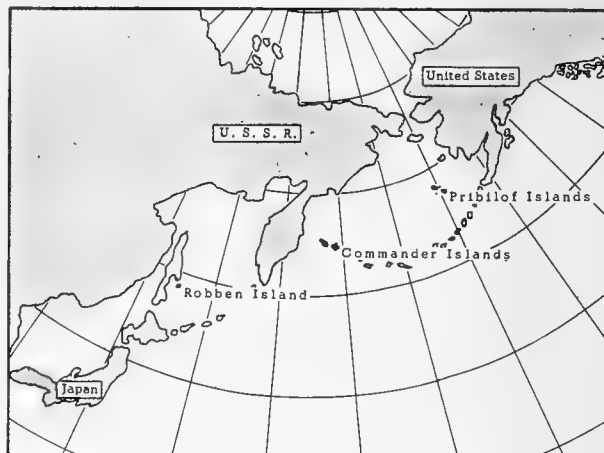
Over 3 million pounds of fish were produced in 1961 at the 101 National Fish Hatcheries operated by the U. S. Fish and Wildlife Service. Production was increased at both warm- and cold-water hatcheries. The National Hatcheries in 1961 reduced the factor for converting fish food to fish flesh to an all time low of 2.3 and increased fish production per man-year of employment to 6,695 pounds.



Fur Seals

FUR SEAL SKIN TAKE FROM PRIBILOF ISLANDS LOWER:

During the 1962 sealing season the production of fur seal skins by the Pribilof Islands staff of the U. S. Bureau of Commercial Fisheries amounted to 77,915 skins. Of that amount, 60,578 skins were harvested on St. Paul Island and 17,337 skins on St. Georges Island.



Breeding grounds of the northern fur seals.

The harvest in 1962 was lower by almost 20,000 skins from that for 1961. In 1961, the Bureau harvested more than the usual number of seals as part of a planned reduction in the herd.

Note: See Commercial Fisheries Review, March 1962, p. 34;

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PRICES FOR ALASKA FUR SEAL SKINS SET RECORD AT FALL 1962 AUCTION:

The fall auction in 1962 (October 25-26) of United States Government-owned fur seal skins yielded close to \$2.5 million. The average price per skin received for male fur seal skins (Black, Kitovi, and Matara) was \$107.53, a new record price. This average price compares with an average of \$106.42 paid at the spring 1962 auction, and was also higher than the \$86.69 average for skins sold in the fall 1961 auction. In addition, the average price received for Lakoda or female sheared seal skins was \$48.40 as compared with an average of \$44.33 received at the spring 1962 auction and an average of \$41.05 received at the fall 1961 auction.

Average prices per skin received for processed male fur seal skins at the fall 1962 auction were (average for spring auction in parentheses): Black, \$115.99 (\$108.88); Kitovi, \$105.81 (\$101.23); Matara, \$99.04 (\$107.66). Prices received at the fall 1962 auction for Japanese-owned fur seal skins as compared with the spring 1962 auction were: Black, \$121.41 (up about 6.1 percent); Kitovi, \$98.10 (down about 1.0 percent); Matara, \$100.75 (down about 9.6 percent).



Fur seal skins sold in the October 1962 auction amounted to 19,851 conventionally processed male skins, 5,762 Lakoda or sheared female skins, and 337 low-quality natural-sheared skins.

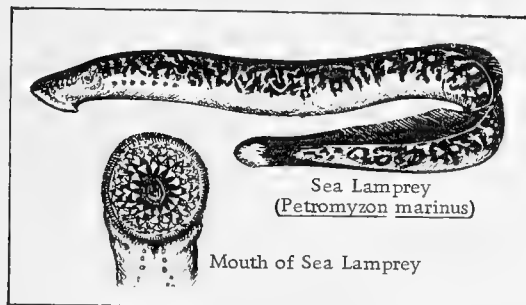
Note: See Commercial Fisheries Review, July 1962 p. 19; December 1961 p. 29.



Great Lakes Fishery Investigations

ADULT SEA LAMPREY POPULATION DECLINES IN LAKE SUPERIOR AND LAKE MICHIGAN:

The network of assessment barriers operated by the U. S. Fish and Wildlife Service on Lake Superior and Lake Michigan streams to count the number of adult sea lampreys migrating to spawning grounds was closed



July 13, 1962. Counts of lampreys at the 29 Lake Superior installations totaled 9,225 in 1962, as contrasted with counts at the same barriers in 1961 of 68,197. Barriers in three Lake Michigan streams took 8,089 lampreys in 1962, as compared with 12,886 in 1961. The reduction of adult lampreys in Lake Superior is believed to be the result of the chemical treatment of the tributary streams which was completed by the end of 1960.

LAKE ERIE 1962 FISH POPULATION SURVEY COMPLETED:

M/V "Musky II" (October-November 1962): The Lake Erie fish population survey was continued during October and November 1962 by the U. S. Bureau of Commercial Fisheries research vessel Musky II. Despite frequent interruptions caused by bad weather, the fall 3 day-night series of trawl hauls was completed at 2 stations in the western basin. Supplemental data on length of fish near the end of the growing season were collected at several other localities. Field activities in November were directed primarily toward sampling of commercial catches at various south shore ports of Lake Erie.

The numbers and species of fish caught during the 3 day-night series of trawl hauls were similar at the two stations. The average 10-minute haul at Bono (station 49) produced 662 fish, of which 86 percent were young-of-the-year. At East Harbor (station 4), the catches averaged 715 fish per haul, and 92 percent were young-of-the-year. Yellow perch, spot-tail shiners, and emerald shiners dominated the catch in both areas. A total of 39 young yellow pike (walleye) were collected.

The average length in inches of young-of-the-year fish of various species collected in western Lake Erie in October 1962 were: yellow perch, 3.1; yellow pike, 9.1; white bass, 3.6; sheepshead, 4.4; smelt, 2.7; gizzard shad, 4.2; alewife, 4.6; spot-tail shiner, 2.9; trout-perch, 3.2; and emerald shiner, 2.7.

Surface water temperatures in the western basin of Lake Erie decreased sharply from about 60° F. at the beginning of October to 47° F. by the end of the month. Temperatures in Sandusky Bay were several degrees lower.

Sampling of the customary species of fish in the commercial catch was difficult due to

low fishing effort and poor catches. Scales were collected from 1,472 specimens. Only yellow perch were readily available, although modest numbers of yellow pike, white bass, and sheepshead were also sampled. A few ciscoes and whitefish, but no blue pike, were observed in the landings.

On November 12 the Musky II was placed in drydock for the winter. Data collected on the 1962 Lake Erie investigations is being compiled and analyzed.

Note: See Commercial Fisheries Review, December 1962 p. 36.

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LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 10 (October 30-November 11, 1962): To study fish distribution in southeastern Lake Michigan during the period of fall turnover was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Cisco. All operations were conducted off Saugatuck and Holland, Mich. Several days were lost during the cruise period because of high winds which are not uncommon in the Great Lakes during November.

During the latter part of the cruise the water was practically the same temperature out to a depth of about 35 fathoms; surface water temperatures ranged mostly between 50° to 52° F. Warm-water fish were found at appreciably greater depths than during the summer period of thermal stratification, when most were confined to depths of less than 10 or 12 fathoms. Chubs, which prefer colder water, were abundant at depths as shallow as 15 fathoms during the summer, but during this cruise were not abundant in water shallower than 40 fathoms. The depth distribution of different species of fish during cruise 10, on the basis of one or more bottom-trawl tows at 5, 7, 10, 15, 18, 20, 25, 30, 35, 40, and 45 fathoms, is summarized as follows:

Chubs (practically all Coregonus hoyi)--5 to 45 fathoms, but scarce inside 20 fathoms, and abundant only at 45 fathoms.

Lake herring--5 to 45 fathoms. Only a few were caught.

Yellow perch--7 to 30 fathoms, but few deeper than 20 fathoms. The largest concentrations were at 10 to 15 fathoms; catches

varied somewhat from day to day. No young-of-the-year yellow perch were caught, and only a few yearlings.

Alewives--5 to 45 fathoms. Young-of-the-year were mostly at 7 to 20 fathoms, but others were uniformly distributed throughout the range of depths sampled.

Smelt (both young-of-the-year and older)--5 to 20 fathoms. There were no large catches.

Spot-tail shiners--5 to 20 fathoms. The larger shiners preferred the deeper water, and the smaller ones the shallower water.

Emerald shiners--7 to 20 fathoms. Few were caught.

Trout-perch--7 to 20 fathoms.

Slimy sculpins--7 to 45 fathoms. Mostly 30 to 35 fathoms.

Deepwater sculpins--35 to 45 fathoms. Abundant only at 45 fathoms.

Other species--a few johnny darters were caught at 5 to 20 fathoms, 2 longnose and 1 white sucker at 7 fathoms, a single 8.5-inch whitefish at 10 fathoms, and 1 logperch at 10 fathoms.

The catch in a nylon gill net of 1¼-inch mesh (stretched), set obliquely from surface to bottom in 26 fathoms, indicated that alewives were scattered vertically at all depths, but were most common in the upper 16 fathoms. The smaller alewives (probably yearlings) especially seemed to favor the upper strata. Chubs (Coregonus hoyi) were caught as near the surface as 5 fathoms, but were more common near the bottom. A few smelt were caught between the surface and a depth of 8 fathoms, but none deeper.

Experimental fishing with a 1-meter plankton net of large mesh (No. 1558 Nitex) and small midwater trawls did not yield any small chubs. The nets were towed at various levels between surface and bottom, in areas where water depth ranged from 5 to 40 fathoms. Three small chubs (4 to 5 inches long) were caught in bottom trawls at 15 fathoms.

During cruise 10, considerable effort was devoted to collecting materials for electrophoretic and serological studies on various species of chubs. Blood, meat, livers, hearts,

gill arches, and eye lenses were frozen for future use. A few live specimens were sent to the University of Michigan. Most of the material was from trawl catches, but some was from nylon gill nets (600 feet each of $2\frac{3}{8}$ - and $2\frac{1}{2}$ -inch mesh) set overnight at 40 fathoms. That set yielded chubs of the following species: 231 *C. hoyi*, 2 *C. kiyi*, 1 *C. alpenae*, 1 *C. zenithicus*. The same set also yielded 10 lake herring and 5 alewives.

Note: See Commercial Fisheries Review, December 1962 p. 36.

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LAKE TROUT DISTRIBUTION STUDIES IN WESTERN LAKE SUPERIOR CONTINUED:

M/V "Siscowet" Cruise 8 (October 10-30, 1962): Substantially larger numbers of spawning fish than at any time since 1959 were indicated in the annual assessment of spawning populations of lake trout in the Apostle Islands region of Lake Superior. On this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet, a total of 57,400 feet of large-mesh gill nets (5- to 6-inch mesh), fished at 9 locations, caught 99 spawning lake trout. All of the 78 fish (which were alive in the nets) were tagged and released. Only one lake trout had a fresh sea lamprey wound.

The lengths of the fish ranged from 21.6 to 30.1 inches (the average was 25.8 inches). The 3 females caught averaged 29.2 inches. The number of fish in each of the 6 age groups represented was: IV, 4; V, 18; VI, 28; VII, 37; VIII, 9; and IX, 2.

Since 10 percent of the lake trout larger than 25 inches in the Wisconsin lake trout assessment catches were fin-clipped, it was expected that some of those hatchery-reared fish would be caught on the spawning reefs later in the fall of 1962. The complete absence of fin-clipped lake trout from catches on the outlying spawning grounds (Gull Island Shoal, Michigan Island) led to speculation that the mature hatchery-reared fish may return to spawn near the original planting sites. Nets set on or immediately adjacent to the planting sites yielded 14 spawning lake trout. Of those, 4 ripe males were fin-clipped--2 at SE. Basswood Isle and 2 at Manitou Isle Shoal. Two of the fin-clipped fish were planted as fingerlings in 1956, and one each in 1955 and 1958.

Small-mesh gill nets (150 feet each of $1\frac{1}{2}$ - and $2\frac{1}{2}$ -inch mesh), fished on the spawning grounds with the large-mesh nets, caught predominately longnose suckers and round

whitefish. No fish eggs were found in the stomachs of about 175 suckers and 50 round whitefish.

A limited amount of reef fishing was conducted in Michigan waters at Pine River Shoal, Point Abbaye, Point Isabelle, and Keweenaw Point by commercial fishermen under contract with the U. S. Bureau of Commercial Fisheries. Approximately 5,000 feet of large-mesh gill nets ($4\frac{5}{8}$ - to 6-inch mesh) were fished at each location. Only 3 spawning lake trout (all males) were caught--1 at Point Isabelle and 2 at Point Abbaye. Gale-force winds during the spawning season prevented adequate coverage of those reefs and other Michigan spawning reefs.

Note: See Commercial Fisheries Review, December 1962 p. 37.



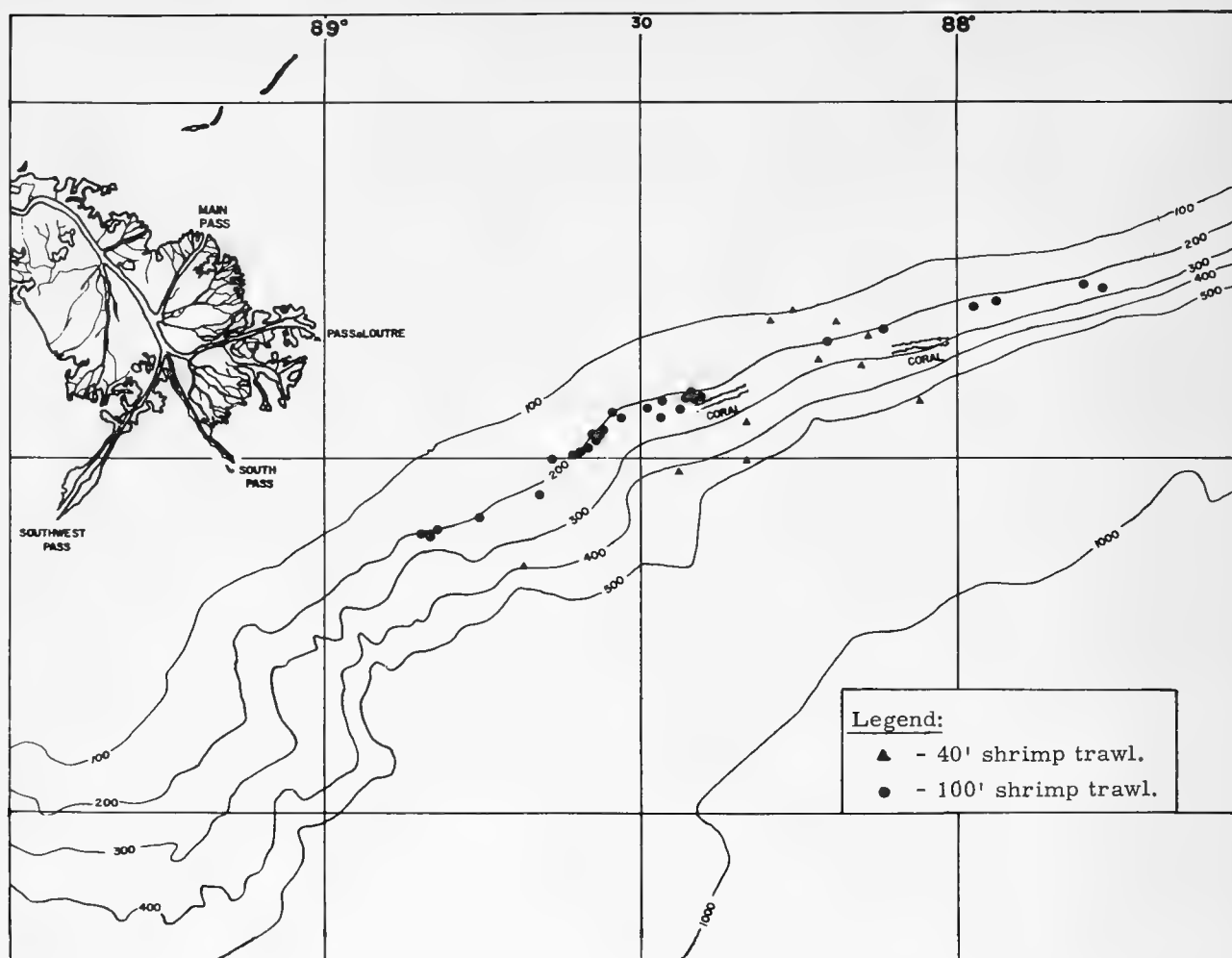
Gulf Exploratory Fishery Program

PRODUCTION-TYPE FISHING FOR ROYAL-RED SHRIMP TRIED IN GULF OF MEXICO:

M/V "Oregon" Cruise 82 (October 22-November 4, 1962): The royal-red shrimp grounds off the Mississippi Delta were explored during this 14-day trip by the U. S. Bureau of Commercial Fisheries exploratory vessel Oregon. The three objectives of the cruise were to: (1) extend seasonal production-type coverage to the October-November period, (2) continue systematic studies of faunal distribution on the upper Continental Slopes, through a series of shrimp trawl drags on a transect reaching from 100 to 1,000 fathoms across the royal-red shrimp grounds, and (3) obtain samples of the small deep-water shrimp (Penaeopsis megalops) for commercial canning experiments.

Production-type fishing for royal-red shrimp (Hymenopenaeus robustus) was conducted with a 100-foot flat trawl held open by 12-foot doors. Heaviest concentrations were again found between 195 and 210 fathoms, with catches falling off rapidly both deeper and shallower. A total of 20 drags lasting 3 hours each were made in that depth range. Gear fouling or shark damage occurred on 4 drags. Catches from the 16 successful drags ranged from 165 to 355 pounds of heads-on royal-red shrimp per drag for a total of 3,890 pounds. The shrimp graded 87 percent 31-35 count (heads-off), and 13 percent 36-42 count.

Three drags in 210 to 230 fathoms yielded somewhat lower catches of 60 to 155 pounds



Shows the station pattern for Cruise 82 of the M/V Oregon (October 22-November 4, 1962).

for an average of 118 pounds of heads-on royal red shrimp. Six drags in 180 to 195 fathoms yielded catches of 1 to 40 pounds for an average of only 15 pounds per drag.

A 350-pound sample of small deep-water shrimp was caught for canning tests. Concentrations of these were light.

A series of northers curtailed operations before the shrimp trawl transect was complete, after 11 drags had been made with a 40-foot flat trawl in depths grading downward from 100 to 500 fathoms. Predominant fish in the depth range worked were hake (Urophycis sp.), whiting (Merluccius sp.), and macrourids.

A 12-foot six-gilled cow shark (Hexanchus griseus), weighing an estimated 2,200 pounds

was caught during the cruise. It was the first time on record that this species was caught in the Gulf of Mexico.

Note: See Commercial Fisheries Review, November 1962 p. 25, October 1962 p. 19.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-31 (November 11-23, 1962): Catches of brown shrimp off Freeport and Aransas Pass, Tex., were good on this cruise by the Belle of Texas, operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico. A 45-foot shrimp trawl

was used at all stations, and one 3-hour tow was made in each of the 3 depth ranges in each statistical area.

Of the 4 statistical areas worked by the research vessel, area 18 yielded the largest shrimp catch--a total of 73 pounds from 2 depth ranges, most of which were brown shrimp counting 15-20 to the pound from the 20-40 fathom depth range. The largest catch of white shrimp (13 pounds of 26-30 count) made during the trip was from 0-20 fathoms of the same area.

A total catch of 62 pounds from area 20 was made up of 49 pounds of 26-30 count brown shrimp from the 0-20 fathom depth, and small amounts of brown shrimp counting 12-20 to the pound from the other depth ranges. A scattering of white and pink shrimp were caught in the shallower depths of the same area.

The largest catch of 12-15 count brown shrimp made on this trip was 23 pounds from 20-40 fathoms of area 21. The up to 20 fathom depth of that area yielded about 25 pounds, mostly all brown shrimp of 31-40 count to the pound. The 40-60 fathom depth yielded less than one pound of 12-15 count brown shrimp.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, December 1962 p. 42.



Hawaii

COMMERCIAL FISHERY LANDINGS, JULY 1961-JUNE 1962:

Landings of sea and pond fish in the State of Hawaii in the fiscal year July 1, 1961-June 30, 1962, amounted to 13.9 million pounds valued at \$2.9 million reported for the ing to the Hawaiian Division of Fish and Game. The fiscal year 1962 over-all landings were very close to the 13.7 million pounds valued at \$2.9 million report for the preceding fiscal year. As in the past years, the commercial landings were made up largely of tuna and tuna-like fishes. These tuna and tuna-like species accounted for 85.5 percent of total volume and about 69.2 percent of the total value in fiscal year 1962. The landings in this fiscal year other than tuna and tuna-like fishes were made of numerous species with the swordfishes and related species accounting for about 4.1

percent of the total value and 5.3 percent of the total value.

Table 1 - Hawaiian Commercial Fishery Landings and Ex-Vessel Value, July 1961-June 1962

Species		Quantity	Value
English Name	Hawaiian Name	1,000 Lbs.	\$1,000
Ocean Catch:			
Amberjack	Kahala	69	21
Big-Eyed Scad	Akule & Hahalalu	244	165
Crevalles	Ulua, Omilu	76	33
Dolphin	Mahimahi	109	47
Goatfishes	Weke-ula, Weke Moelua, Moano Kumu, Malu	111	59
Mackerel	Opelu	221	89
Snappers:			
Gray	Uku	56	22
Pink	Opakapaka, Kalekale	123	59
Red	Ulaula Koae, Ehu or Ulaula	68	60
Swordfishes, Spearfishes, & Marlins		579	151
Tuna & Tunalike fishes:			
Albacore	Ahipalaha (tonbo)	16	5
Big-Eyed		1,182	579
Yellowfin	Ahi	385	142
Skipjack	Aku	10,319	1,261
Bonito or little tuna	Kawakawa	3	1/
Shellfish:			
Crabs	Kuahuu, Koni, Papai, Muala	34	23
Limpet	Opihi	7	4
Lobster, spiny	Ula	10	7
Octopus	Hee	3	2
Squid	Muhee	9	4
Other fish & shellfish		246	92
Total Ocean Catch		13,870	2,825
Pond Catch		61	48
Grand Total		13,931	2,873
1/Less than \$500.			

The Island of Oahu in the fiscal year ending June 30, 1962, accounted for 10.4 million pounds (valued at \$2.2 million) or about 76 percent of the quantity and 75 percent of the value. The Island of Hawaii was the second most important center of the State's fishing industry and accounted for about 14 percent of both the total landings and value. The only other Island of the six reporting landings of over one million pounds was that of Maui Island.

Table 2 - Hawaiian Commercial Fishery Landings by Islands, July, 1961 - June, 1962

Island	Sea Catch		Pond Catch		Total Catch	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000
Hawaii	1,976	409	-	-	1,976	409
Maui	1,332	200	-	-	1,332	200
Lanai	14	5	-	-	14	5
Molokai	5	4	1	1	6	5
Oahu	10,380	2,139	60	47	10,440	2,186
Kauai	163	68	-	-	163	68
Total	13,870	2,825	61	48	13,931	2,873

Table 3 - Hawaiian Commercial Fishery Landings by Months, July 1961 - June 1962

Month	Sea Catch		Pond Catch		Total Catch	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000
1961						
July	2,587	367	5	5	2,592	372
August	1,649	274	3	2	1,652	276
September	970	203	4	3	974	206
October	777	186	6	4	783	190
November	486	168	7	6	493	174
December	634	246	10	9	644	255
1962						
January	628	154	9	9	637	163
February	645	174	4	3	649	177
March	498	187	5	3	503	190
April	810	194	3	2	813	196
May	1,531	284	2	1	1,533	285
June	2,656	389	2	1	2,658	390
Total....	13,871	2,826	60	48	13,931	2,874

Note: Due to rounding, totals in Tables 2 and 3 do not agree in some cases.

As in previous years the months of May-August of this fiscal year were responsible for the bulk of the total landings. In the fiscal year ending June 1962, the months of May-August accounted for about 61 percent of the total landings of fish and shellfish. The landings in June 1962 amounted to about 2.7 million pounds or close to 19.1 percent of the total volume. Landings of pond fish in 1962 fiscal year were confined largely to the late fall and winter months, with about one-third of the total pond catch reported in the months of December and January.

Note: See Commercial Fisheries Review, December 1961 pp. 37 and 38.



Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, January-October 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for October 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International

U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, October 1962 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homogenized ^{3/}
	Short Tons	1,000 Gallons	.. (Short Tons) ..	
October 1962:				
East & Gulf Coasts	34,042	5,103	11,106	850
West Coast ^{2/}	2,860	96	1,764	-
Total	36,902	5,199	12,870	850
Jan.-Oct. 1962 Tot.	275,242	31,485	^{1/} 105,893	8,915
Jan.-Oct. 1961 Tot.	265,497	30,522	89,534	10,487

^{1/}Does not include crab meal, shrimp meal, and liver oils.

^{2/}Includes Hawaii, American Samoa, and Puerto Rico.

^{3/}Includes condensed fish.

^{4/}Previous cumulative totals have been revised.

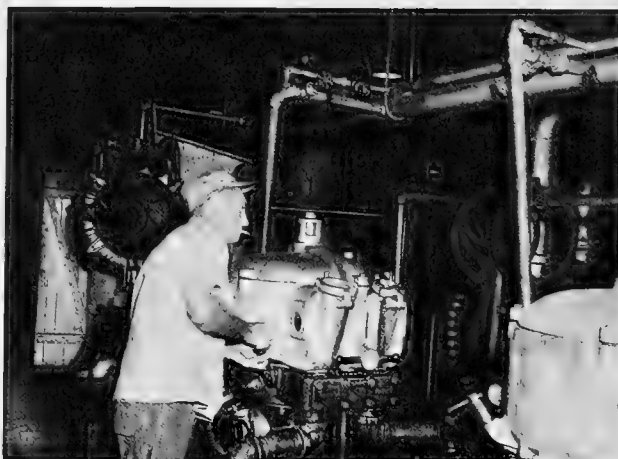


Fig. 1 - In fish meal plants after each day's operations, the centrifuges are disassembled, cleaned, and reassembled.

Association of Fish Meal Manufacturers are shown in the table.

During October 1962, a total of 36,600 tons of fish meal and scrap and 5.1 million gallons of marine-animal oils were produced in the United States. Compared with October 1961, this was an increase of 20,400 tons or 126 percent in meal and scrap production and 3 million gallons or 146 percent in oil.

Menhaden meal amounted to 32,500 tons--accounting for 89 percent of the October 1962 meal total. Oil from menhaden (nearly 5 million gallons) comprised 98 percent of the October 1961 oil production.

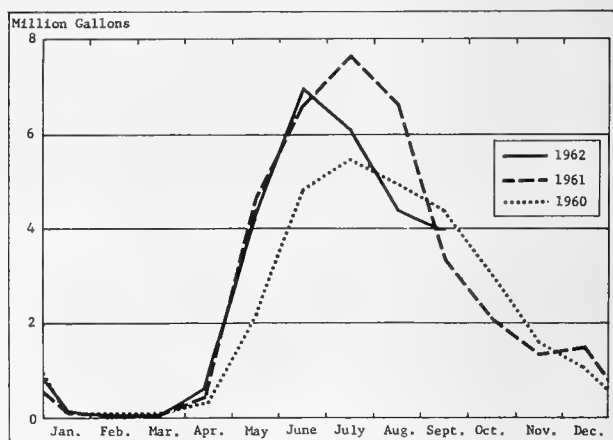


Fig. 2 - U. S. production of marine animal oils by months, 1960-62.

There were 14,200 tons of fish solubles produced in October 1962--6,700 tons above the same month of the previous year. There were 850 tons of homogenized condensed fish produced in October 1962 as compared with 1,000 tons in the same month in 1961.

U.S. Production of Fish Meal, Oil, and Solubles, October 1962 with Comparisons					
Product	October		Jan.-Oct.		Total
	1/1962	1961	1/1962	1961	1961
(Short Tons)					
Fish Meal and Scrap:					
Herring	482	106	3,533	5,093	5,268
Menhaden 2/	32,545	13,254	235,411	231,345	247,551
Sardine, Pacific	16	483	730	1,171	2,518
Tuna and mackerel	2,074	1,775	17,170	17,191	21,243
Unclassified	1,497	611	18,110	13,703	14,757
Total	36,614	16,229	274,954	268,503	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	14,160	7,461	107,190	91,760	100,551
Homogenized condensed fish	850	998	10,465	10,405	11,690
(Gallons)					
Oil, body:					
Herring	37,000	6,000	647,180	807,547	818,017
Menhaden 2/	4,990,657	1,753,998	29,485,855	28,778,982	31,355,570
Sardine, Pacific	1,400	17,549	22,639	40,400	86,167
Tuna and mackerel	56,591	101,715	519,613	586,860	762,509
Other (including whale)	19,287	193,582	715,118	1,335,522	1,386,542
Total oil	5,104,935	2,072,844	31,390,405	31,549,311	34,408,805

1/Preliminary data.

2/Includes a small quantity produced from thread herring.

3/Not available on a monthly basis.

During the first 10 months of 1962, domestic meal and scrap production totaled 275,000 tons--6,500 tons above the same period of 1961. The marine-animal oil yield totaled 31.4 million gallons--a decrease of 159,000 gallons as compared with the same period in 1961.

* * * * *

Major Indicators for U. S. Supply, November 1962: For the first eleven months

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, November 1962					
Item and Period	1962	1961	1960	1959	1958
(Short Tons)					
Fish Meal:					
Production 1/:					
December	-	12,750	9,185	14,381	14,636
November	11,756	10,058	8,725	10,791	9,749
October	36,614	16,852	24,455	22,026	11,630
Jan.-Sept.	238,340	248,645	216,425	227,963	177,600
Jan.-Dec. prelim. totals 2/	-	289,039	257,969	275,396	216,510
Jan.-Dec. final tots.	-	311,265	290,137	306,551	248,140
Imports:					
December	-	23,268	15,564	5,508	8,490
November	-	25,649	6,149	3,673	6,082
October	12,732	9,425	12,515	3,821	5,899
September	13,698	13,941	9,487	9,224	5,079
Jan.-Aug.	194,996	145,562	87,846	110,699	74,802
Jan.-Dec.	-	217,845	131,561	132,925	100,352

(Table continued on next column)

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, November 1962 (Contd.)					
Item and Period	1962	1961	1960	1959	1958
(Short Tons)					
Fish Solubles:					
Production 3/:					
December	-	4,936	2,897	5,429	6,305
November	4,974	5,140	3,524	4,628	8,888
October	15,010	8,459	7,192	12,487	8,867
Jan.-Sept.	102,645	93,886	85,316	142,815	106,117
Jan.-Dec. totals	-	112,254	98,929	165,359	130,177
Imports:					
December	-	472	60	420	5,180
November	-	3,649	282	3,089	867
October	290	110	-	1,908	2,548
September	178	263	38	1,732	253
Jan.-Aug.	5,018	2,245	2,794	19,481	5,719
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567
(1,000 Gallons)					
Fish Body Oils:					
Production:					
December	-	1,488	1,038	1,865	1,839
November	1,023	1,360	1,202	1,147	1,028
October	5,104	1,901	3,024	2,176	1,139
Jan.-Sept.	26,285	28,620	21,422	19,170	17,416
Jan.-Dec. prelim. totals 4/	-	33,471	26,690	24,418	21,625
Jan.-Dec. final tots.	-	34,409	27,853	24,945	21,977
Exports:					
December	-	1,398	2,108	2,611	383
November	-	190	1,952	813	2,037
October	26	2,027	591	1,911	3,591
September	29	1,269	1,861	1,129	665
Jan.-Aug.	12,828	11,447	12,643	12,800	5,863
Jan.-Dec.	-	16,331	19,154	19,264	12,539

1/Does not include crab meat, shrimp, and misc. meals.

2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.

3/Includes homogenized fish.

4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 and 1961 are preliminary.

of 1962, United States fish meal and fish oil production was higher by 4.0 percent and 1.6 percent, respectively, as compared with the same period of 1961. Fish solubles production increased 13.5 percent.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

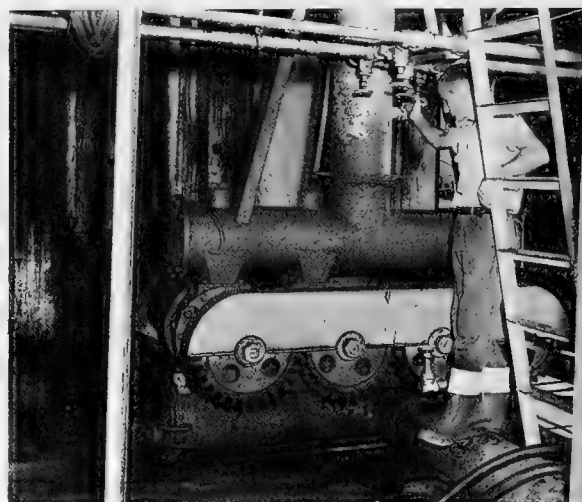
Production and Imports, January-September 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 9 months of 1962

U. S. Supply of Fish Meal and Solubles, Jan.-Sept. 1961-62 and Total for 1961			
Item	Jan.-Sept.		Total
	1/1962	1961	1961
..... (Short Tons)			
Fish Meal and Scrap:			
<u>Domestic production:</u>			
Menhaden	202,866	218,091	247,551
Tuna and mackerel	15,096	15,416	21,243
Herring	3,051	4,987	5,268
Other	17,327	13,780	37,203
Total production	238,340	252,274	311,265
Imports:			
Canada	33,818	31,194	38,218
Peru	156,111	104,885	151,439
Chile	8,255	10,078	12,074
Angola		1,543	1,543
So. Africa Republic	9,584	10,526	13,026
Other Countries	926	1,277	1,545
Total imports	208,694	159,503	217,845
Available fish meal supply ..	447,034	411,777	529,110
Fish Solubles:			
Domestic production 2/ ...	101,088	93,706	112,241
Imports:			
Canada	1,196	859	1,001
So. Africa Republic	1,192	1,097	1,351
Other Countries	2,808	552	4,387
Total imports	5,196	2,508	6,739
Available fish solubles supply	106,284	96,214	118,980
1/Preliminary. 2/50-percent solids. Includes production of homogenized condensed fish.			

was 35,257 short tons or 8.6 percent greater than during the same period of 1961. Domestic production was 13,934 tons or 5.5 percent lower, but imports were 49,191 tons or 30.8 percent greater than in the same 9 months of 1961. Peru continued to lead other countries with shipments of 156,111 tons during the first 9 months of 1962--51,226 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons ex-

ceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.



At a reduction plant at Moss Point, Miss., a large fish pump is used to unload the fish from the vessel hold and transport it to the plant. Such a pump can empty a hold of 500,000 menhaden in less than an hour.

The United States supply of fish solubles (including homogenized fish) during January-September 1962 was 10,070 tons more than during the same period in 1961. Domestic production increased 7.9 percent, but imports jumped 107.2 percent.

* * * * *

Production and Imports, January-October 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 10 months of 1962 was 58,949 short tons (or 13.5 percent) greater than during the same period of 1961. Domestic production was 6,451 tons (or 2.4 percent) greater and imports were 52,498 tons (or 31.1 percent) greater than in the same 10 months of 1961. Peru continued to lead other countries with shipments of 164,573 tons during the first 10 months of 1962--53,528 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-October 1962 was 18,358 tons more than during the same period in 1961. Domestic production increased 15.2 percent, but imports jumped 109.5 percent.

U. S. Supply of Fish Meal and Solubles, Jan.-Oct. 1961-62 and Total for 1961			
Item	Jan.-Oct.		Total
	1/ 1962	1961	1961
.....(Short Tons).....			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	235,411	231,345	247,551
Tuna and mackerel	17,170	17,191	21,243
Herring	3,533	5,093	5,268
Other	18,840	14,874	37,203
Total production	274,954	268,503	311,265
Imports:			
Canada	37,568	33,559	38,218
Peru	164,573	111,045	151,439
Chile	8,255	10,078	12,074
Angola	-	1,543	1,543
So. Africa Republic	9,884	11,376	13,026
Other Countries	1,146	1,327	1,545
Total imports	221,426	168,928	217,845
Available fish meal supply ..	496,380	437,431	529,110
Fish Solubles:			
Domestic production 2/ ...	117,655	102,165	112,241
Imports:			
Canada	1,236	880	1,001
So. Africa Republic	1,442	1,097	1,351
Other Countries	2,808	641	4,387
Total imports	5,486	2,618	6,739
Available fish solubles supply	123,141	104,783	118,980

1/Preliminary.

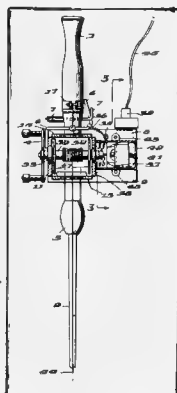
2/50-percent solids. Includes production of homogenized condensed fish.



Inventions

NEW ELECTRICALLY OPERATED FISHING REEL WITH BRAKE PATENTED:

A new fishing reel can be electrically or manually driven. The reel rotates as long as a fish attracted by a moving lure does not start to bite, according to the inventor. In order to ease the casting of the fishing line and reduce energy losses, the friction in the inner system has been minimized through elimination of gears, use of ball bearings, and selective coupling and uncoupling of the electric motor. It has a special mechanical brake. In order to protect the motor from shock, the mechanical brake automatically shuts off the current before it starts

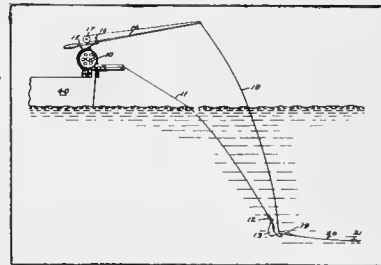


to function. (Patent Number 3,030,046, U. S. Patent Office Classification Number 242-84,53, granted April 17, 1962, to Leo Markoff-Maghadam, 2938 Newark St., NW., Washington 8, D. C.)

* * * * *

NEW HAND WINCH ATTACHMENT FOR TROLLING TACKLE PATENTED:

The inventor of a new hand winch attachment for a trolling rod and reel claims his device will take in fishing line faster than the fishing reel. The winch lowers and retrieves to depths of 300 feet and over by increments as small as $\frac{9}{16}$ inch. By using the



winch and a double-line arrangement, a fisherman can play a fish without the encumbrance of a sinker. The line from the rod and reel runs freely through a loop in a weighted line attached to the winch. The winch can be operated by one hand. It includes an adjustable rod holder and can be rapidly attached or removed from any fishing station on a boat. (Patent Number 2,786,296, U. S. Patent Office Classification Number 43-43,12, granted Harry A. Loebenstein, 165 San Felipe Ave., San Francisco 27, Calif.)



Irradiation Preservation

ICED STORAGE LIFE OF SHRIMP EXTENDED BY LOW-DOSAGE PASTEURIZATION:

The iced storage life of shrimp was increased by at least two weeks over untreated controls by experiments of low-dose radiation pasteurization (50,000 to 100,000 rads^{1/}). Those were the partial results of a research project on radiation pasteurization of shrimp conducted by the Louisiana State University, Baton Rouge, La.

Experiments showed that when shrimp are caught under supervision and irradiated within 12 hours, the two-week period can be extended for an additional week. In one in-

^{1/}Rad - the quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest.

Erg - unit of energy.

stance, a sample irradiated at 100,000 rads and maintained in crushed ice was organoleptically acceptable and had a good odor and appearance after seven weeks, as compared to the unirradiated control which had a putrid odor and was spoiled after three weeks, even though it was stored under the same conditions.

Shrimp irradiated at 50,000 rads and stored at 36°-40° F. were organoleptically acceptable for only one week longer than the unirradiated control. Iced storage has the advantage of reasonable constancy and uniformity, compared to most commercial refrigeration which varies considerably for different units, and areas within the units. But the refrigeration unit used in the studies is relatively constant for a commercial unit and was maintained at 37°-39° F.

From all evidence gathered so far, it is apparent that the iced storage life of shrimp can be increased successfully by low-dose radiation, and that the dose range necessary to give maximum protection with a minimum of undesirable chemical and physical changes is 50,000 to 100,000 rads. At that dose level, organoleptic and chemical results were consistently better than the unirradiated samples. Tests include pH, indole, trimethylamine, ammonia, phenol red, and the picric acid test.

The procedures used for obtaining fresh shrimp, such as the method of handling and storing, and the time of holding prior to irradiation, are significant factors in ascertaining the keeping qualities after irradiation. The quality of shrimp is not improved by radiation pasteurization, and it should be understood that only products of high initial quality can be preserved successfully. When those methods are used commercially, shrimp of inferior grade or those which have been out of the water for several days should be sold locally as soon as possible, and should not be subjected to irradiation treatment.

Note: See Commercial Fisheries Review, October 1962.

* * * * *

RESEARCH ON IRRADIATED FISHERY PRODUCTS SHOWS PROMISE:

In cooperation with the Atomic Energy Commission, the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass., is conducting studies on low-level radiation of soft-shell clam

meats and haddock fillets. The purpose is to determine if pasteurization doses of radiation will extend the refrigerated shelf life of those products without changing their normal, fresh flavor and odor.

Fresh clams can now be kept in the refrigerated state for only about five days. Haddock can be kept in the chilled state for only about twelve days; and, even though this fish can be frozen satisfactorily, there is still a high demand for it in the fresh state. An extension of the fresh, unfrozen shelf life of those products may open up new markets for them in cities far from producing areas.

The Laboratory's findings indicate that radiation-pasteurization will significantly increase the shelf life of clams and haddock. Soft-shell clam meats packaged in cans and irradiated at a level of 450,000 rads were acceptable quality after 30 days of storage at 33° F. Haddock fillets that were irradiated at a level of 250,000 rads could also be kept for 30 days at a temperature of 33° F. No irradiated flavors and odors were imparted to those products; but, if the storage temperature was increased to 42° F., then a reduction of about 50 percent of the shelf life resulted.

In addition to the above, the Laboratory investigated the stability of amino acids and B-vitamins in both irradiated clams and haddock. Little or no change resulted in those nutrients because of the use of radiation.

The laboratory tests indicate that radiation-pasteurization offers promise as a new method of preserving fishery products.

Note: See Commercial Fisheries Review, October 1962 p. 25.



Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1962:

Current canned stocks reflect the 1962 comeback of the Maine sardine after the drastic decline in the catch and pack in 1961. Cannery stocks of Maine sardines on November 1, 1962, were over 1.1 million cases greater than those of November 1, 1961, but only 90,000 cases above stocks on hand two years ago on November 1, 1960. Distributors' stocks of canned Maine sardines were up 13.9 percent from stocks on hand Novem-

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Cannery Stocks, November 1, 1962, with Comparisons^{1/}

Type	Unit	1962/63 Season	1961/62 Season					1960/61 Season				
		11/1/62	7/1/62	6/1/62	4/1/62	1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60
Distributors	1,000 actual cases	230	134	99	148	193	202	208	215	267	233	277
Cannery	1,000 std. cases ^{2/}	1,348	374	50	45	144	221	201	294	506	1,029	1,258

^{1/}Table represents marketing season from November 1-October 31.

^{2/}100 $3\frac{3}{4}$ -oz. cans equal one standard case.

ber 1, 1961, but down 17.0 percent from those on hand November 1, 1960.

The 1962 season pack totaled 2,073,100 standard cases on November 1, 1962, and on November 24, 1962, the pack was virtually complete at 2,115,000 cases, according to the Maine Sardine Council. On April 15, 1962, carryover stocks at the cannery's level amounted to about 33,000 cases. Adding the pack as of November 1, 1962, results in a total supply of 2,106,100 cases as of that date--up 93.8 percent from the total supply reported November 1, 1961, but down 7.7 percent from the total supply on November 1, 1960.

Table 2 - Canned Maine Sardines--Season Supply as of November 1, 1962, with Comparisons

Item	1962	1961	1960
	(Std. Cases--)		
Cannery's carryover stocks on April 15 ^{2/}	33,000	457,000	313,000
Season pack to Nov. 12 ^{1/}	2,073,100	630,000	1,970,000
Total supply as of Nov. 1	2,106,100	1,087,000	2,283,000

^{1/}100 $3\frac{3}{4}$ -oz. cans equal one standard case.

^{2/}The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1960 and 1961 season. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.

The Maine Sardine Council reported November 24, 1962, that present inventories are considered normal and that the industry is making an impressive comeback in regaining domestic consumer markets lost to imports as a result of the critically small Maine pack in 1961. In mid-November 1962, the wholesale price of Maine sardines in New York was \$9.31 a case, down 24 percent from the average price of \$12.31 a case in November 1961, but up 9.5 percent from the average price of \$8.50 a case in November 1960, according to the U. S. Bureau of Commercial Fisheries, Fishery Market News Service at New York City.

Note: See *Commercial Fisheries Review*, Sept. 1962 p. 33, Jan. 1962 p. 23.



Market News Service

QUARTER OF A CENTURY OF SERVICE TO FISHERY INDUSTRY COMPLETED:

The Fishery Market News Service of the U. S. Bureau of Commercial Fisheries in December 1962 completed a quarter of a century of providing fish prices and other up-to-date information to the fishing industry of the United States.

Through daily reports in seven important fishery centers of this country, the Fishery Market News Service places the buyer and the seller on an even footing regarding market information, and the distributor is kept advised on market activity. The Market News Service reports are issued from Boston (Mass.), New York City, Chicago (Ill.), Seattle (Wash.), San Pedro (Calif.), New Orleans (La.), and Hampton (Va.).



Fig. 1 - Fishery Market News Reporter on the Seattle waterfront collecting data on receipts and prices. In the upper righthand corner is a netload of halibut being hoisted from the hold of a fishing vessel to the dock.

The first report was issued December 19, 1937, from New York City only. During the years the service expanded to the six other cities.

The Fishery Market News Service, often called "the eyes and the ears of the fishing industry," is under the Bureau of Commercial Fisheries, Fish and Wildlife Service. Market information is released not only within a specific area, but pertinent facts are relayed to the other key cities and areas. In this way a fisherman landing halibut in Seattle knows the wholesale price that fish is bringing that day in New York City or Chicago or other cities. In the same way, distributors are fully aware of what landings are being made, what species, as well as the prices paid in all parts of the country.

In this way the shrimp fisherman in the Gulf area knows the prices being paid for shrimp in New York City, Chicago, and Los Angeles; Boston fishermen know what frozen fillets are bringing in the major markets throughout the country. With this complete information, business transactions relating to fish and fishery products can be conducted with

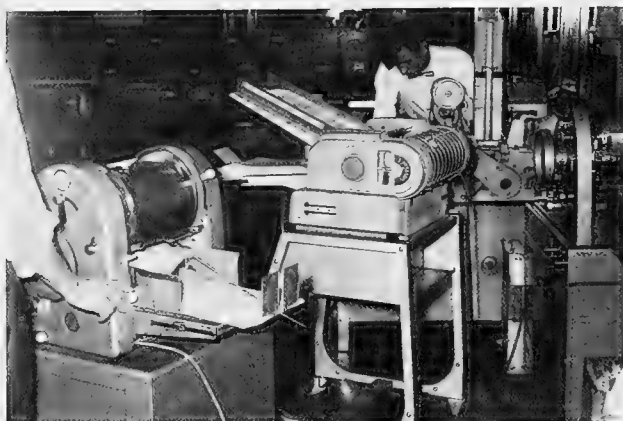


Fig. 2 - Typical scene in a Fishery Market News Office towards the end of the day. The daily "Fishery Products Reports" are mimeographed, folded, addressed, and mailed.

each interested party having current and authentic data on the condition of the market in other cities, the supply, the daily landings, and the prices.

The market information is made available to the public through daily mimeographed reports called "Fishery Products Reports," by telephone, personal contact, collect telegrams or teletype, and in some instances through radio and newspapers. Each office issues its own daily report, which is designed to meet the needs of the fishery industries in its area.

There are about 10,500 subscribers to the daily mimeographed reports. Most of them are persons interested in daily market transactions for fishery products. Reports sometimes are used as the basis for "open-end" contracts in which the seller and buyer agree that the price of a shipment will be the highest paid for that product at a designated market on the day of delivery.

The mailing lists include fisheries people, lawyers, research analysts, investment analysts, marine firms, transportation companies, chemical companies, gear manufacturers, banks, and many others.



Michigan

RECORD NUMBER OF LAKE TROUT EGGS COLLECTED AT HATCHERIES:

A record 6.5 million "green" lake trout eggs were collected in the fall of 1962 at the Michigan Conservation Department's Marquette and Harrietta Hatcheries, keeping Michigan in pace with plans for accelerated fish plantings in the upper Great Lakes.

Most of the fish raised from the eggs will be released in Lake Superior and possibly in the upper reaches of Lakes Michigan and Huron in 1964. However, 120,000 lake trout will be reared from the eggs for release in Michigan's inland lakes during 1964.

The Great Lakes plantings will follow up intensive sea lamprey control efforts which have produced impressive signs of success in Lake Superior and its tributaries.

More than 5 million lake trout have been released in the upper Great Lakes (mostly Lake Superior) since 1959 when the lake trout rehabilitation program was set into motion under the direction of the Great Lakes Fishery Commission.

Long-range plans of the Commission call for stepping up the plantings to about 7 million lake trout a year as soon as the sea lamprey problem is solved.

Note: See Commercial Fisheries Review, December 1962 p. 46, July 1962 p. 28.



North Atlantic Fisheries

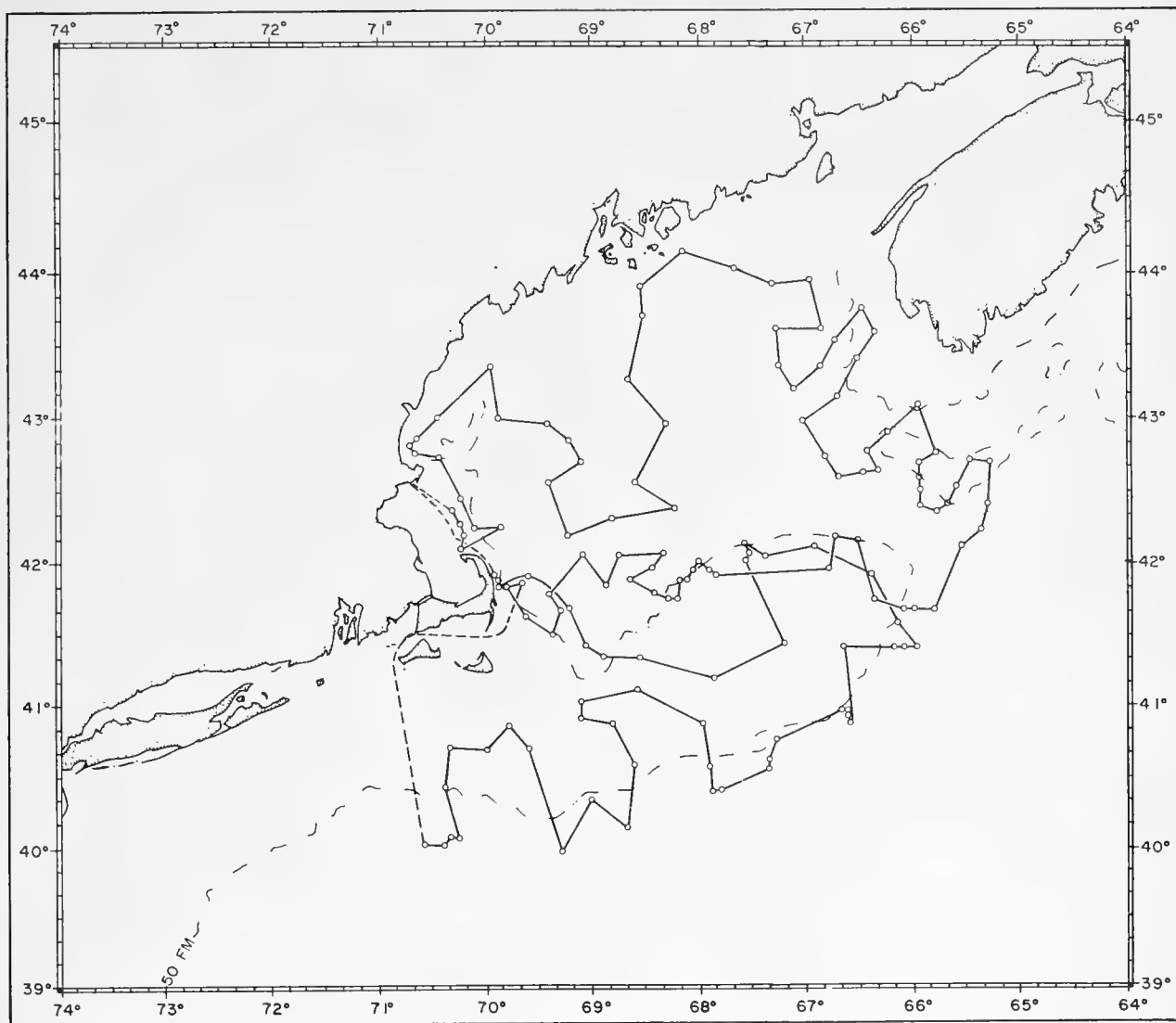
Exploration and Gear Research

DISTRIBUTION AND ABUNDANCE STUDIES OF YOUNG-OF-THE-YEAR HADDOCK AND OTHER GROUND FISH CONTINUED:

M/V "Delaware" Cruise 62-12 (October 9-20, 1962): To determine the distribution and abundance of young-of-the-year haddock and other groundfish species was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. This trip was the first part of a 26-day survey cruise with the area of investigation confined to the inshore waters along the Massachusetts and Maine coasts, the Gulf of Maine, western Nova Scotia, Browns Bank, and the northern edge of Georges Bank.

Trawling operations during Cruise 62-12 were conducted at 90 fishing stations using a No. 36 otter trawl, with the cod end and upper belly lined with $\frac{3}{4}$ -inch mesh netting. Bathythermograph casts were made at all stations and every 10 miles between stations. Sea-bed drifters were released at selected stations. All species of fish were counted and measured. Special collections of fish, invertebrates, haddock blood, blood samples from other groundfish species, and whiting stomachs were made throughout the cruise.

The number of young-of-the-year haddock caught in each area worked was as follows: inshore waters 54, Gulf of Maine 7, western Nova Scotia 57, Browns Bank 253, northern



Track chart of October 1962 groundfish survey cruises by M/V Delaware, U. S. Bureau of Commercial Fisheries research vessel.

edge of Georges Bank 35, and a few stations in the Channel 14. Haddock and whiting were frequently caught on this trip, while many other species were caught more infrequently.

M/V "Delaware" Cruise 62-13 (October 25-November 4, 1962): The second part of the continuing study on distribution and abundance of young-of-the-year haddock and groundfish survey cruise was completed on November 4 when the Delaware returned to her base at Woods Hole, Mass.

During this phase of the study, the Delaware fished at selected stations off Cape Cod, on Georges Bank, and south to Block Canyon.

Adverse weather conditions prevented completion of all the work planned for this phase of the study.

Biological information collected on the cruise included a series of haddock blood samples to aid in the identification of various haddock stocks. Also, special collections of sculpins, haddock, sea herring, and invertebrates were made for detailed study at the Bureau's Woods Hole Biological Laboratory. Hydrographic observations were made throughout the cruise to determine the relation of the distribution of groundfish species to the environment. Young haddock were found to be most abundant on Browns Bank, the northern

edge of Georges Bank, and on the western side of Nova Scotia.

Note: See Commercial Fisheries Review, November 1962 p. 32.



North Atlantic Fisheries Investigations

MAINE HERRING RESEARCH, AUGUST 1962:

During the first week of August 1962, 2,200 sardine herring were tagged at Moore Harbor, Isle au Haut, by biologists of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Maine. Eighty tags were recovered during August. A series of 400 sardines each tagged with green, scarlet, and yellow tags were released to compare the effect of color upon the recapture rate. During the month, fish tagged with 23 yellow, 14 green, and 1 scarlet tags were recaptured.

Eighteen sardine samples of 200 each were collected from the coastal fishery. The age of the sardines in 15 of the samples determined by the otolith technique demonstrated that the 1960 year-class dominated the August catches.

A 4-day cruise aboard the Bureau's research vessel Delaware was conducted in search of herring spawning areas along the northeast section of Georges Bank, and samples of herring were collected at 5 to 10 stations. Blood samples, lengths, weights, gonadal stages, fecundity, fin ray and gill raker counts, and occurrence of diseases were obtained and recorded for the herring collected.



North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF COLUMBIA RIVER CONTINUED:

M/V "Commando" Cruise 5 (August 21-September 9, 1962): The chartered research vessel Commando returned to Seattle September 9, 1962, completing a 20-day cruise to survey the marine fauna southwest of the mouth of the Columbia River. This was the seventh survey cruise under the U. S. Bureau of Commercial Fisheries-Atomic Energy Commission cooperative program. Two cruises were made by the M/V John N. Cobb (cruises 50 and 53) and five by the Commando.

(Several additional cruises were made by the John N. Cobb to survey the deep-water off the Columbia River as part of the Bureau's exploratory fishing program.) A standard 400-mesh eastern commercial otter trawl with a small mesh liner in the cod end was used to monitor stations at depths from 50 to 450 fathoms. A Gulf of Mexico shrimp trawl with extra weights on the doors was used to sample fauna at stations from 500 to 950 fathoms.

Species of fish encountered in greatest abundance were Dover sole (Microstomus pacificus), sablefish (Anaplopoma fimbria), ocean perch (Sebastes alutus), and hake (Merluccius productus). Dover sole were found at stations from 50 to 450 fathoms, with the largest catch of 800 pounds per hour taken at 100 fathoms. Small sablefish were abundant at 50 fathoms (4,000 pounds per hour) and the catch of larger fish was greatest between 300 and 400 fathoms. Ocean perch were taken at depths between 100 and 225 fathoms. At the 150-fathom station 1,200 pounds per hour were recorded. The best catch of hake was made at 125 fathoms (4,000 pounds per hour). Other species of vertebrates were taken, but not in large numbers.

As in previous surveys, the tanner crab (Chionoecetes tanneri) was the only commercial invertebrate found in large numbers. The distribution pattern of the males and females of this species was similar to that found during the May-June 1962 survey, with the sexes almost completely segregated. The males were most abundant at 275 fathoms and the females at 350 fathoms. The centers of abundance of both sexes occurred 25 fathoms shallower than during the May-June survey of 1962 but at the same depths as during the June-July survey of 1961. The size of both adult male and female crabs decreased with depth.

The species and quantities of invertebrates taken during this survey were in agreement with previous surveys with the exception of the following: (1) Molpadid sea cucumbers were not found in large numbers, (2) increased numbers of a squid (Gonatus sp.) were taken in waters deeper than 175 fathoms, and (3) two species of deep-water shrimp were encountered which were new to the operations area.

A series of bottom grabs were successfully taken out to 75 fathoms using a Smith-McIntyre grab weighted with 100 pounds. Metering block failure prevented samples

from being taken at deeper stations, but indications are that the grab will be operational in deeper water. From the successful grabs, fauna were obtained of value to the program.

Samples of fish collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington.

Samples of bottom sediment were frozen for personnel at the Bureau's Biological Laboratory in Seattle.

The cooperative program with the Oregon Fish Commission to study the migrations of sablefish and Dover sole in the area of investigation was continued. Tagging was conducted at stations from 75 to 400 fathoms.

The study on heterotrophic marine bacteria by personnel from the College of Fisheries, University of Washington, was also continued during the cruise.

M/V "Commando" Cruise 6 (October 30-November 13, 1962): The eighth in a series of cruises designed to study deep-water marine animal life along a track line southwest of the Columbia River mouth was completed on November 13, 1962, by the U. S. Bureau of Commercial Fisheries chartered vessel Commando. The trip was part of a cooperative study with the Atomic Energy Commission. Two of the cruises in the series were made by the Bureau's exploratory fishing vessel John N. Cobb and six were made by the Commando.

Because of adverse weather conditions during the cruise, only the stations from 50 to 150 fathoms could be monitored. A standard 400-mesh eastern commercial otter trawl with a small-mesh liner in the cod end was used to sample the epifauna at each of the stations. A Smith-McIntyre bottom grab was used to sample the infauna.

Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus), hake (Merluccius productus), ocean perch (Sebastes alutus), and dogfish (Squalus acanthias) were the species of vertebrates found in greatest abundance at the stations surveyed. The largest catch of Dover sole of 1,000 pounds per hour was at 75 fathoms. A similar catch per hour of rex sole was made at 50 fathoms. About 400 pounds of hake were caught

at 50 fathoms in a one-hour tow. About 3,500 pounds of ocean perch were caught at the 150-fathom station during a one-hour tow. About 14,000 pounds of dogfish were caught at the 75-fathom station. It was the first time dogfish were caught in any large concentrations along the track.

Species of invertebrates caught with the trawl during the survey were in agreement with previous surveys at those depths. A total of 600 pounds of purple sea urchin (Allocentrotus sp.) were caught at 150 fathoms.

In addition to sampling the fauna at each station, bottom temperatures and salinity samples also were taken as part of the survey.

Samples of fish collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington. Samples of bottom sediment were frozen for personnel at the Bureau's Biological Laboratory in Seattle.

Sablefish and Dover sole were tagged by personnel from the Oregon Fish Commission who were aboard the vessel during the survey.

Also, the study on marine bacteria by personnel from the College of Fisheries, University of Washington, was continued.

Note: See Commercial Fisheries Review, August 1962 p. 34, July 1962 p. 34, June 1962 p. 31, April 1962 p. 20, February 1962 p. 32, November 1961 p. 26, September 1961 p. 35.

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SHRIMP DISTRIBUTION OFF VANCOUVER ISLAND STUDIED:

M/V "John N. Cobb" Cruise 56 (October 15-November 16, 1962): Shrimp explorations off the west coast of Vancouver Island from Barkley Sound to Cape Cook were completed on November 16 when the U.S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb returned to her base at Seattle after a 5-week cruise. A 42-foot Gulf of Mexico shrimp trawl was used.

A total of 60 exploratory drags of one-half hour each were made, primarily in the 60-95 fathom depth interval. Of the 60 drags, one yielded 150 pounds of pink shrimp (Pandalus jordani), 11 drags had between 25 and 50 pounds of pink shrimp, and 45 drags yielded less than 25 pounds of shrimp. Three drags out of the 60 were unsuccessful because of damage to the trawling gear. None yielded

shrimp in the quantity required for commercial fishing.

Exploratory operations on this trip were severely restricted during the last two and one-half weeks of the cruise because of bad weather.

The procedures used to survey the areas explored were:

1. Sounding transects were made with a high-resolution, low-frequency echo-sounder.

2. Shrimp trawl drags were made on those grounds indicated by the echo-sounder recording as being free of snags and having soft substrate. Initially, drags were made at 10-fathom intervals from 30-100 fathoms to find where the shrimp were most concentrated. Since no large concentrations were found, subsequent drags were made at random throughout the 60-105 fathom depth range in which some shrimp were caught.

3. Samples of shrimp were frozen and returned to the Bureau's Seattle Biological Laboratory for examination.

Note: See Commercial Fisheries Review, November 1962 p. 32.



Oceanography

FIRM RECEIVES CONTRACT TO DEVELOP ANTIFOULING DEVICE:

An oceanographic research and development firm of Houghton, Wash., has been awarded a contract by the U. S. Office of Naval Research to investigate the feasibility of a new principle for making salinity measurements in ocean waters, based on a device developed by this firm for another electrochemical measurement and which has been used successfully for over six months.

The contract calls for the firm to develop and test in their laboratories (located near Lake Washington and Puget Sound) several new models of an instrument which eliminates biological fouling by marine algae, bacteria, or other marine life through direct ultrasonic vibration of the measuring sensor or electrode.

The tests will determine the comparative rates of fouling with the new device and with conventionally used sensors for determining salinity.

Biological fouling has hampered research scientists in their efforts to take environmental measurements of salinity and other water properties. In a rather short period, conventional electrodes cease to function properly due to fouling on the electrode surface. The new development potentially ends the problem.

The original development by the Houghton firm was for laboratory oxidation-reduction potential measurements and its principle had not been tested for environmental salinity measurements, using conductivity cells and temperature sensors for the purpose of computing salinity.

* * * * *

INSTRUMENTATION SYSTEM BEING DEVELOPED FOR STUDY OF OCEAN BOTTOM CURRENTS AND SEDIMENT MOVEMENT:

A contract to develop and fabricate a complete instrumentation system for a study of bottom currents and sediment movement across the Continental Shelf that borders the Pacific Northwest was awarded to a Seattle, Wash., firm specializing in instrumentation for fisheries and oceanographic research.

The contract was let by the University of Washington which is conducting the study under an Atomic Energy Commission contract. The project will be conducted by the University's Oceanography Department. Focal point of the research will be at the mouth of the Columbia River.

A spokesman for the Seattle firm said the instrument package will include an underwater platform, a shipboard power supply control, and the platform and shipboard control chassis.

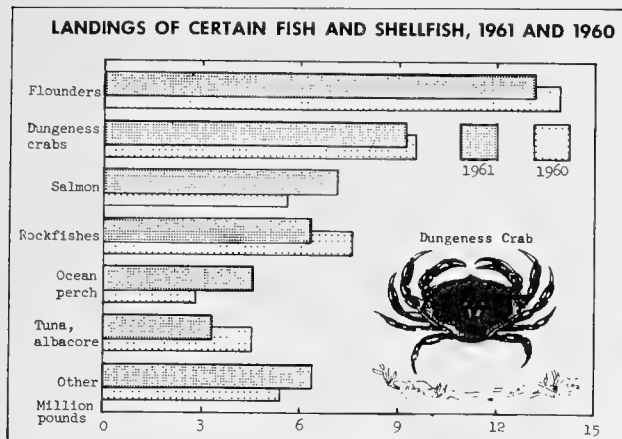
Underwater television will be the key device in the four-year study which has as its objective the perfection of a method to measure in detail the bottom current profile over the Continental Shelf and the amounts and characteristics of the sediment moved by the current. Also, investigators seek to determine the relationships between the sediment movement and the bottom characteristics and water velocities as they exist near the sediment-water interface.



Oregon

FISHERY LANDINGS, 1961:

Fish and shellfish landings in Oregon during 1961 totaled 49.8 million pounds valued at \$6.5 million ex-vessel. Compared with 1960, this was a gain of 632,000 pounds (1 percent) in quantity and \$398,000 (7 percent) in value. Greater landings of ocean perch (up 1.8 million pounds) and salmon (up 1.5 million pounds) contributed largely to the 1961 increased catch.



Flounders led all species in quantity landed during 1961 with 13.2 million pounds. Dungeness crabs were next with 9.2 million pounds, and salmon third with 7.1 million pounds. Rockfish, ocean perch, and albacore tuna followed with 6.2, 4.6, and 3.2 million pounds, respectively. These 6 varieties of fish and shellfish comprised 87 percent of the 1961 total catch.

* * * * *

ESCAPEMENT OF SUMMER STEELHEAD TROUT ABOVE BONNEVILLE DAM NEAR RECORD IN 1962:

The second highest escapement of summer steelhead trout (*Salmon gairdnerii*) above the upper limit (Bonneville Dam) of the commercial fishery in nearly a quarter of a century was recorded on the Columbia River this year, the Oregon State Fisheries Director announced on October 2, 1962. The run into the river, based on the commercial catch below Bonneville Dam plus the Bonneville passage count, was about 245,000, the largest since 1955. The commercial catch took an estimated 34-35 percent of the run, a record low harvest of the summer run.

Summer steelhead enter the Columbia River April-October with the peak occurring

June-August. During April 1-September 30, 1962, the count over Bonneville Dam was 162,000. A few thousand more may have moved over the Dam in October.

Commercial gill-netters and Indian dip-netters accounted for a substantial portion of the catch above the Dam until 1957 when commercial fishing above Bonneville was prohibited. The remaining very limited Indian fishery in that area accounts for no more than a few thousand steelhead in a year. Hence the Bonneville count for all practical purposes now represents the escapement above the commercial fishery. The record escapement was an estimated 203,000 steelheads in 1952. The average escapement during the past 10 years has been 140,000.

The State Fisheries Director pointed out that this does not mean that number reaches the spawning grounds. Many die from natural and environmental problems before spawning. In addition, the important and rapidly increasing sport fishery in the Columbia River and Snake River systems above Bonneville accounts for a significant percentage of those fish prior to spawning.

One of the primary reasons the commercial catch was a record low percentage of the run was that the summer commercial fishing season was shortened by two days this year to increase the escapement of summer steelhead. The desired effect was realized and near-record numbers passed the commercial fishery into the upper river areas. This occurred even though the run was well below the record of 423,000 fish in 1940.

There is much more to insuring good runs than merely putting substantial numbers of mature fish in the upper river. Disease and water temperature play vital roles in the success of spawning. Subsequently the rearing conditions for the young in the headwater streams may determine the success or failure of the fish of a given brood. But the first step is to get the spawners to the spawning grounds to lay eggs, and in the case of the 1962 summer steelhead run, this first important step has been accomplished.



Oysters

VIRGINIA PRODUCTION ADVERSELY AFFECTED BY MSX:

Nearly half of the rented oyster bed acreage in Virginia was not planted in 1962 because of the ravages made by the

oyster pest MSX (a protozoan parasite). Oyster production in Delaware Bay and Chesapeake Bay, in particular, has been seriously reduced because of MSX, according to the Virginia Institute of Marine Science. All of the areas affected are in high-salinity waters.

In 1961, oystermen in Delaware Bay, where the disease became serious about two years earlier than in Chesapeake Bay, planted rather large seed oysters in the spring and harvested them in the fall and winter without serious losses. Virginia oystermen are hopeful that MSX is now less active in Chesapeake waters.

The year 1962 brought signs of improvement in the afflicted areas but there was little reason for great optimism. In the afflicted areas, MSX appeared to be less abundant but oysters were very scarce. The scarcity of oysters in the infested areas is the chief reason for low optimism. An oyster pest cannot flourish in areas where there are no oysters. Therefore, what would happen if large quantities of oysters were planted in the infested areas is uncertain.

The evidence from trial plantings of oysters is not very encouraging. Each year a bed has been planted in Mobjack Bay, one of the centers of infestation. Those planted in August 1961 are about two-thirds dead now. A tray of James River seed placed in Mobjack Bay in March 1961 lost 60 percent of the oysters the first year, and about 55 percent of the survivors died from March through September 1962. Oysters transplanted from James River in March 1962 have begun already to die from MSX. Those losses occurred without the help of *Dermocystidium*, which is now scarce in Mobjack Bay. If those losses are typical of all infested areas, oyster culture is still not feasible.

The cycle of penetration of the James River seed area by MSX in summer, followed by its disappearance in early spring when salinities are low, was repeated in 1961/62. MSX did not reappear in the James River seed area during the summer of 1962, except on Brown Shoal. Its absence there could not be determined until later in 1962.

Dermocystidium marinum, the fungus which has long taken a toll of Virginia oysters, has about the same pattern of distribution as MSX. However, it seems to be more tenacious in holding its position on the fringes of its area of activity. After limited activity in the summer of 1961, *Dermocystidium* came back strongly in 1962 wherever a supply of oysters was available. Serious losses from the fungus have occurred in limited areas upstream of the range of activity of MSX, but still in relatively salty waters.

For the areas infested with MSX, cautious trial plantings have been suggested by the Institute. The distribution of MSX in Virginia waters has not changed appreciably in the past year. It is possible that as the epidemic from MSX wanes, there will be areas where oysters can be held one or more years without serious losses. The best advice offered is to be sure that disease-free seed is planted, and to avoid crowding of oysters and planted beds. As much isolation from other oysters as possible should be observed for each planting. Like most diseases, MSX probably responds to crowded conditions. No oyster seed of known resistance to MSX is available, although scientists all along the mid-Atlantic coast are working on the problem.

Planting of oysters in MSX-infested areas still appears to be hazardous. The epidemic has subsided considerably which may permit holding oysters for longer periods with fewer losses than in recent years. The Institute states that all plantings should be regarded as trials, and watched very carefully for protection of investments. Advice on time for planting, and time for sampling beds, to obtain the best results is available from the Institute at Gloucester Point, Va.



Pollution

MEETING HELD ON POLLUTION OF THE SEAS BY OIL WASTES:

A meeting was held on October 26, 1962, by the National Committee for Prevention of Pollution of the Sea by Oil. Purpose of the meeting was to report to the Committee regarding the views of non-government organizations concerning amendments to the 1954 Convention that were developed at the International Conference in London in March and April 1962.

The Director of Program Review for the U. S. Fish and Wildlife Service and one of the two Department of the Interior representatives on the Committee, reported wholehearted endorsement of the amendments by national conservation organizations. These organizations urged that the amendments be submitted to Congress for early ratification and that immediate steps be taken to implement the resolutions adopted by the London Conference. The most important has to do with providing port facilities to dispose of oily wastes.

All shipping and maritime organizations which had been contacted by members of the Committee also support the measures.



The National Committee will report to the Secretary of State on these attitudes and make recommendations to submit the 1962 amendments for ratification. The report will cover the reservations relating to the 1954 Convention and the four recommendations of the Senate Foreign Relations Committee in their report to the State recommending ratification of the 1954 Convention.

At the urging of the Department of Interior representative, a strong United States position was adopted by the Shipping Coordinating Committee in their recommendations to the Secretary of State for the Intergovernmental Maritime Consultative Organization

Council (IMCO) meeting, October 17, 1962. This recommendation covered an agenda item urging that IMCO establish machinery allowing it to act as a clearing house for research, statistics, technical information, and reports on the status of pollution of the seas by oil, in order to foster international cooperation.

The Commandant, U. S. Coast Guard and Chairman of the National Committee, reported that the IMCO Council received the United States position favorably and referred it to the Maritime Safety Committee to recommend means of implementation. When this is done there will be an international exchange of information which was lacking at the 1962 conference and which was a handicap to the work of the representatives.

Closely cooperating with the U. S. Fish and Wildlife Service in oil pollution problems are the National Audubon Society, the Sport Fishing Institute, the Pacific Marine Fisheries Commission, the National Fisheries Institute, and other national conservation organizations.

* * * * *

TOXICITY OF CERTAIN CHEMICALS TO FISH STUDIED:

Experiments to determine the toxicity to four species of juvenile estuarine fishes of certain chemicals have been conducted by the Sandy Hook (New Jersey) Laboratory of the U. S. Bureau of Sport Fisheries and Wildlife. The chemicals tested were an organophosphorous insecticide (parathion), a chlorinated insecticide (p, p⁸ DDT), a synthetic detergent, and a soap (Lux). Preliminary screening experiments indicate that eels (Anguilla rostrata), winter flounders (Pseudopleuronectes americanus), Atlantic silversides (Menidia menidia), and mummichogs (Fundulus heteroclitus) were not affected by 650 parts per million (p.p.m.) of the soap. But the median tolerance levels (Tlm)--the levels at which half the fish are killed--for the detergent range from 10 to 23 p.p.m.; for DDT, 0.001 to 0.008 p.p.m.; and for parathion, 3.6 to 5.3 p.p.m. The reaction of eels to parathion suggests that the insecticide is more toxic at relatively low salinities (Tlm at 5 o/oo is 0.03 p.p.m.; Tlm at 20 o/oo is 5.3 p.p.m.)

The experimental fish were feeding actively in the laboratory two weeks before

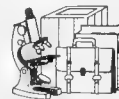
the test. No food was offered the fish during exposure to various concentrations of the chemicals in 20-liter glass jars. The jars were filled with 19 liters of water at 20 o/oo salinity, 20° C. (68° F.), and pH 7.4. The jars were glass covered and aerated.

* * * * *

NEW LABORATORY TO STUDY WATER POLLUTION BY PESTICIDES:

A new \$65,000 Public Health Service laboratory to study the presence of pesticides in soil and water has been opened in Atlanta, Ga., the U. S. Department of Health, Education, and Welfare announced November 26, 1962. The new laboratory is part of a full-scale investigation of water pollution by pesticides which was begun in 1959 in the southeastern States. The amounts of insecticides now reaching waterways are being measured and possible damage to stream and other life is being studied, particularly in cases where the insecticides are presently at low levels. "A start has been made toward evaluation of pesticides and their use in relation to water pollution," the Director of the Atlanta laboratory said, "but much remains to be done. It is evident that pesticide pollution can and does occur and, in quantities below the level acutely toxic to aquatic life, it may be rather common in areas of routine pesticide usage."

Established and operated by the Public Health Service's Division of Water Supply and Pollution Control, the new laboratory will provide analytical facilities to supplement national field studies of pesticides, insecticides, and herbicides in streams, lakes, and ground water. It will extend Public Health Service research in the field of insecticides, which already involves some \$3 million annually of Public Health Service funds. The research covers many fields of medicine and science, including toxicology, entomology, vector control, and environmental health.



Preservation

QUALITY OF OCEAN PERCH HELD IN REFRIGERATED SEA WATER GOOD:

The first landings of ocean perch held in an experimental refrigerated sea water tank aboard a Gloucester, Mass, commercial fishing vessel (Judith Lee Rome) proved very suc-

cessful. The quality of the fish held 11 days in refrigerated sea water storage aboard the vessel was very good. The foreman of the plant where the fish were processed remarked: "best quality 11-day fish I've ever seen." The experiments aboard the commercial fishing vessel are being conducted by technologists from the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass.



Puerto Rico

FISH AND SHELLFISH LANDINGS, 1961:

Puerto Rico's total fish and shellfish landings in 1961 amounted to 7,250,000 pounds valued at \$1,666,000. Landings for that year were up 6.2 percent and the value increased 18.8 percent from the 1960 landings. The increase was mostly in marine finfish and crustaceans (spiny lobster and crab), but landings were somewhat lower for other groups as compared with 1960.

The 1961 salt-water fish and shellfish landings consisted of: finfish 6 million pounds, crustaceans 670,000 pounds, mollusks 60,000 pounds and sea turtles 120,000 pounds. Fresh-water fish landings for the year totaled 400,000 pounds.

Editor's Note: Data evidently do not include tuna landed at Puerto Rico by fishing vessels for use of tuna canneries.



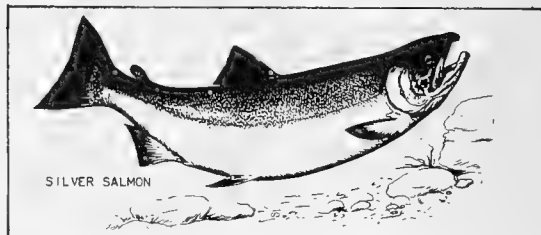
Salmon

FALL 1962 RUN OF ADULT SILVER SALMON TO NORTHWEST PACIFIC HATCHERIES GOOD:

A good run of silver salmon returned to Pacific Northwest fish hatcheries in the fall of 1962, according to the Seattle Regional office of the U. S. Bureau of Commercial Fisheries. Early November 1962 from state and national hatcheries in Washington and Oregon indicated the best run of this species in many years.

Although the run was not complete as of November 9, 1962, it appeared that the number of returning silver salmon, which return to their place of birth after two years in the Pacific Ocean, more than doubled in the past six years.

The report stated that about 15,000 silver salmon had passed through the fish-counting device at Bonneville Dam on the Columbia River since mid-September 1962, the highest return of that species in 22 years at that location. It was emphasized that this figure was only part of the total number returning, since most of the spawning of silver salmon is downstream from Bonneville Dam. At Eagle Creek National Fish Hatchery located



on a tributary of the Clackamas River in Oregon, more than 6,000 silver salmon had passed over the Eagle Creek falls ladder since the run started. Winthrop National Fish Hatchery on the Methow River in north-central Washington had taken more than 150,000 silver salmon eggs from returning fish by early November 1962. The announcement stated that this is encouraging evidence that the Bureau had been successful in its attempt to re-establish a silver salmon run in an up-river portion of the Methow River which had been extinct for a long time. In 1960, Bureau biologists had moved 250,000 silver salmon eggs from the Eagle Creek hatchery to the Winthrop hatchery, where the eggs were hatched and later the young silver salmon were released to go to sea, some of which returned as adults this past fall.

* * * * *

ANTIOXIDANT TESTED TO PREVENT RANCIDITY IN FROZEN SALMON:

In the course of studies on methods of measuring oxidation in fishery products the U. S. Bureau of Commercial Fisheries Technological Laboratory at Seattle, Wash., evaluated EMQ (6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline) as an antioxidant for frozen salmon. The research showed that the antioxidant EMQ has very definite effects in retarding oxidation. Salmon steaks and minced fresh samples held at +20° F. showed no evidence of rancidity after five weeks of storage while control (untreated) samples were unacceptable due to rancidity. In addition, the color of the EMQ-treated samples were nearly unchanged while the control samples had faded appreciably.

However, practice application of this research is not feasible at present. Application of EMQ is difficult because it is insoluble in water. All test samples show that a bitter off-flavor (medicinal) was imparted either by the EMQ or the emulsifying agent. In addition, this antioxidant does not have the approval of the U. S. Food and Drug Administration for use as an additive in foods for human consumption.

* * * * *

COMPARISON OF HATCHERY METHODS FOR REARING SALMON:

Fall chinook salmon fingerlings reared in rectangular recirculating ponds showed significantly better performance in preliminary stamina tests than those reared in raceways. The tests were carried out at the U. S. Fish and Wildlife Service Salmon Cultural Laboratory, Longview, Wash., which designed the ponds. Survival to adults in the ocean as measured by recapture of marked salmon from each group will be the final test of the two rearing methods. A total of 215,000 fall chinook salmon fingerlings are included in each group. Salmon from the two groups will be distinguished by different methods of fin-clip marking.



Shrimp

PINKS REARED FROM EGGS TO JUVENILE STAGES:

Pink shrimp (*Penaeus duorarum*) have recently been reared from eggs to juvenile stages at the Institute of Marine Science, University of Miami. The shrimp on November 26, 1962, were approximately one inch in total length

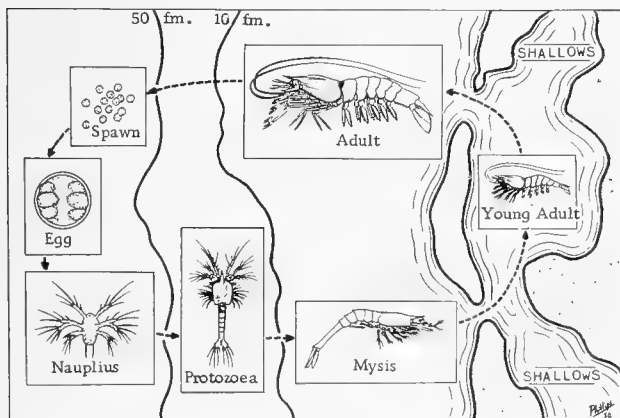


Fig. 1 - Diagram of the life cycle of the white shrimp (*Penaeus setiferus*).



Fig. 2 - Photomicrograph of pink shrimp eggs in several stages of development.

and it is expected that they will be reared to adult size before the experiment is ended. The work was done under a contract with the U. S. Bureau of Commercial Fisheries to study the early life history of pink shrimp.

On two occasions in August 1962, ripe female shrimp spawned in the laboratory and the resulting larvae were reared successfully. The shrimp, collected from the Tortugas shrimp grounds of southern Florida, spawned within 24 hours after being placed in aquaria. Special rearing techniques were used to overcome some of the problems encountered by previous workers. Daily supplies of food and water, as well as individual care of the larvae, increased survival. A mixture of unicellular algae, diatoms, dinoflagellates, and marine yeasts was used as food.

The results of the work have important applications both to the study of the biology of shrimp and the development of aquiculture techniques for shrimp. Growth stages obtained from rearing are useful in identifying specimens collected in plankton tows. The stages obtained from this work verified earlier conclusions regarding the larval development of pink shrimp which resulted from a previous study at the Institute of Marine Science (Dobkin, S. 1961. "Early Developmental Stages of Pink Shrimp (*Penaeus duorarum*), from Florida Waters." U. S. Fish and Wildlife Service Fishery Bulletin 190, vol. 61, pp. 321-349). Perfection of techniques to enable mass rearing of shrimp will facilitate further studies on food preference, effects of temperature and light, and various aspects of behavior. These in turn may shed light on the dynamics of natural populations.



Fig. 3 - Photomicrograph of fifth nauplius of pink shrimp.

The ability to rear shrimp from the egg opens the door to the possible artificial culture of shrimp. Johnson and Fielding (1956: *Tulane Studies in Zoology*, vol. 4, no. 6, pp. 173-190) used pond culture techniques in rearing larvae of the white shrimp (*Penaeus setiferus*). However, there has been no reported success of laboratory rearing of any Atlantic commercial shrimp species through postlarval stages. A Japanese scientist, Dr. Motosaku Hudinaga, has successfully reared penaeid shrimp, first in the laboratory, and then on a larger scale. At the present time his shrimp farm outside Tokyo supplies restaurants with shrimp on a subcommercial basis. It is expected that shrimp farms in central Japan will eventually produce 2,000 tons of shrimp per year (U. S. Bureau of Commercial Fisheries, New Orleans Market News Service, Fishery Products Report 0-234, December 5, 1961).

* * * * *

UNITED STATES SUPPLY INDICATORS,
NOVEMBER 1962:

Item and Period	1962	1961	1960	1959	1958
..... (1,000 Lbs., Heads-Off).					
Total landings, So. Atl. and Gulf States:					
December	-	6,538	7,097	8,716	8,099
November	11,800	9,996	14,454	12,412	12,416
January-October ..	84,246	74,862	119,484	109,531	96,037
January-December ..	-	91,396	141,035	130,659	116,552
Quantity canned, Gulf States ^{1/}:					
December	-	889	977	1,278	1,943
November	2,500	2,369	1,614	2,312	3,424
January-October ..	19,500	12,535	26,003	21,089	21,037
January-December ..	-	15,793	28,594	24,679	26,404
Frozen inventories (as of end of each mo.) ^{2/}:					
December 31	-	19,755	40,913	37,866	32,844
November 30	4/	20,668	37,264	37,334	30,211
October 31	21,815	17,811	31,209	33,057	24,620
September 30	12,843	13,361	24,492	26,119	18,079
August 31	12,754	12,728	20,171	23,780	15,274
March 31	16,607	31,345	23,232	24,893	14,501
Imports ^{3/}:					
December	-	15,442	12,411	10,611	10,448
November	4/	14,852	13,516	10,269	10,617
October	18,279	16,813	14,211	15,340	11,463
January-September ..	89,343	79,175	73,280	70,335	52,866
January-December ..	-	126,268	113,418	106,555	85,394
... (¢/lb., 26-30 Count, Heads-Off) ...					
Ex-vessel price, all species, So. Atl. and Gulf Ports:					
December	-	75.2	54.2	48.4	70.8
November	5/ 93-96	73.5	54.0	46.2	69.0
October	5/ 93-100	68.7	53.0	44.4	66.4
July, Aug. & Sept. .	5/ 85-100	65.5	52.6	47.0	68.4
Apr., May & June .	83.5	54.0	62.4	62.6	74.5
Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:					
December	-	91-92	68-70	64-66	87-89
November	105-110	89-92	69-73	60-65	83-87
October	108-120	83-90	69-73	59-62	80-84
July, Aug. & Sept. .	105-118	70-90	64-77	62-74	78-93
Apr., May & June .	94-104	67-72	74-77	70-82	84-98
^{1/} Pounds of headless shrimp determined by multiplying the number of standard cases by 33.					
^{2/} Raw headless only; excludes breaded, peeled and deveined, etc.					
^{3/} Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.					
^{4/} Not available.					
^{5/} Range.					
Note: Data for 1962 and 1961 are preliminary. November 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.					

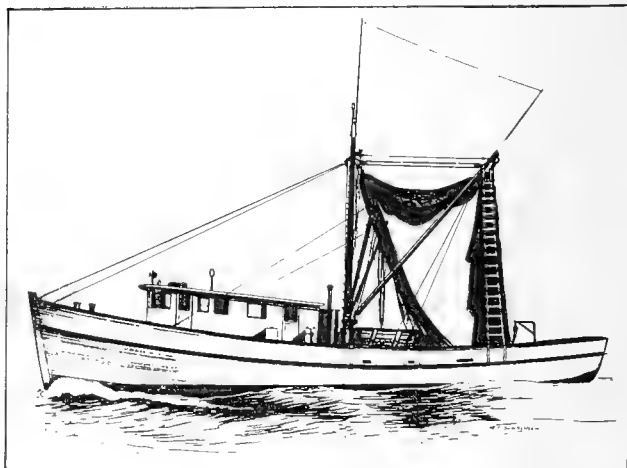


Fig. 1 - Large shrimp trawler.



Fig. 2 - Unloading fresh shrimp at Morgan City, La.



South Atlantic

Exploratory Fishery Program

FISHING GEAR FOR CATCHING HERRING-LIKE FISH TESTED:

M/V "Silver Bay" Cruise 43 (October 29-November 16, 1962): Gear trials with mid-water and off-the-bottom trawls, and fish traps were made on this cruise to test the effectiveness of the gear for catching herring-like fish in the area explored. The area of operations during this 18-day cruise by the exploratory fishing vessel Silver Bay was along the Continental Shelf of the United States between Cape Fear, N. C., and Brunswick, Ga.

A total of 48 fishing stations were made in conjunction with fish detection transects using a whiteline recorder. The gear used included a modified 40-foot British Columbia-style midwater trawl, a 25-foot square high-speed midwater trawl, an 80-foot wing trawl, and baited wire-mesh fish traps suspended off bottom.

A lack of midwater fish tracings and rough weather precluded work in depths deeper than 50 fathoms. Most fish concen-

trations were located within the 10-fathom curve.

Fishing results during the trip were generally poor, but a few good catches were made. Northeast of Myrtle Beach, S. C. ($33^{\circ}47'5''N.$,

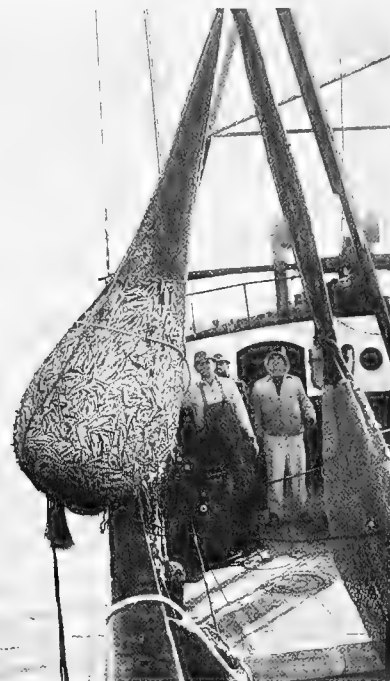


Fig. 1 - 2,500-pound catch of round herring from mid-water trawling during cruise.

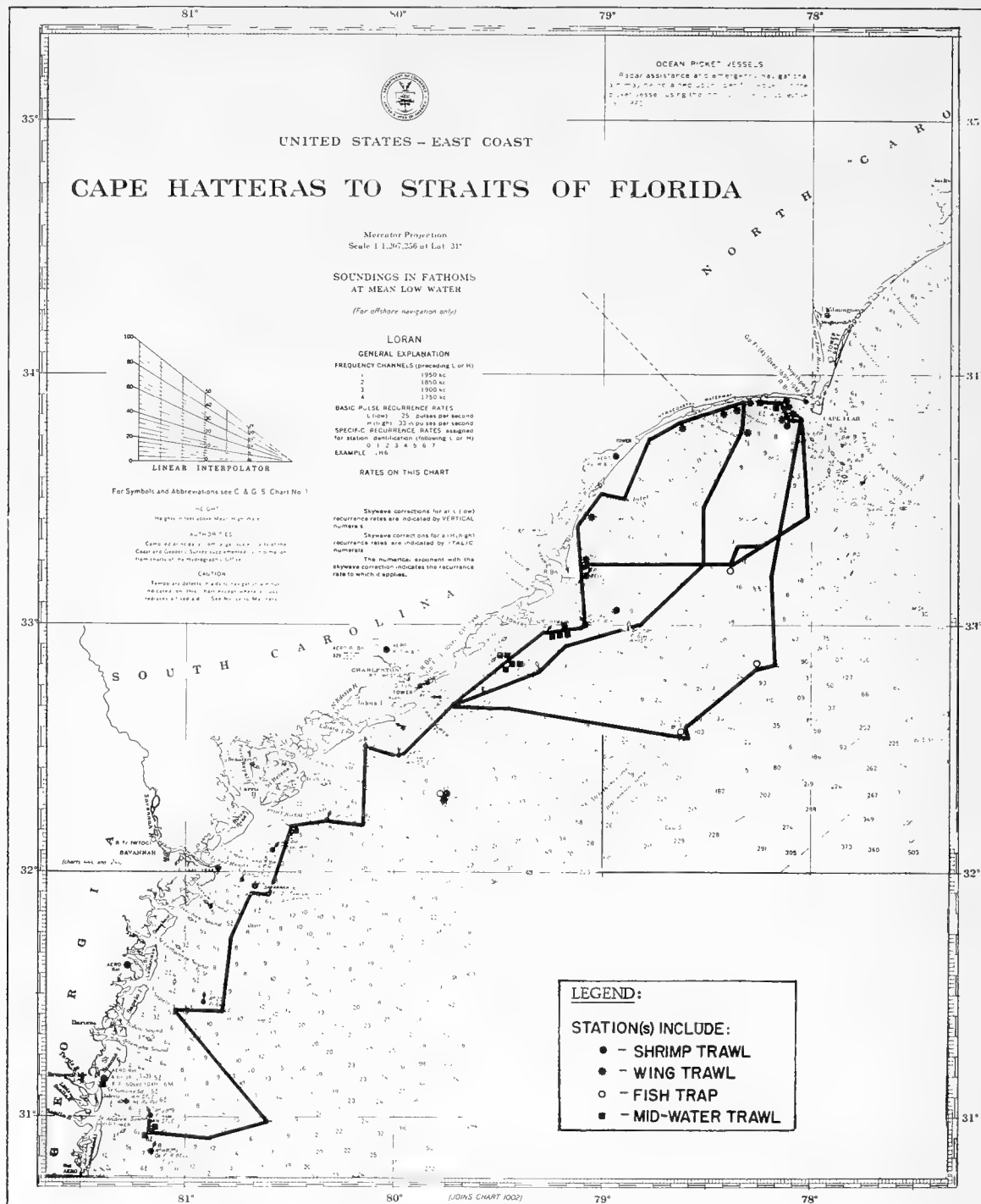


Fig. 2 - Shows station pattern for cruise 43 of the M/V Silver Bay, October 29-November 16, 1962.

78°38'5" W.), 3,500 pounds of anchovies (*Anchoa* sp.) counting 37 to 88 per pound were caught in a 1½-hour tow with the wing trawl rigged on 8-foot bracket doors and fishing approximately 14 inches above the bottom. East of Cape Romain, S. C. (32°52'5" N., 79°28'5" W.), 2,500 pounds of

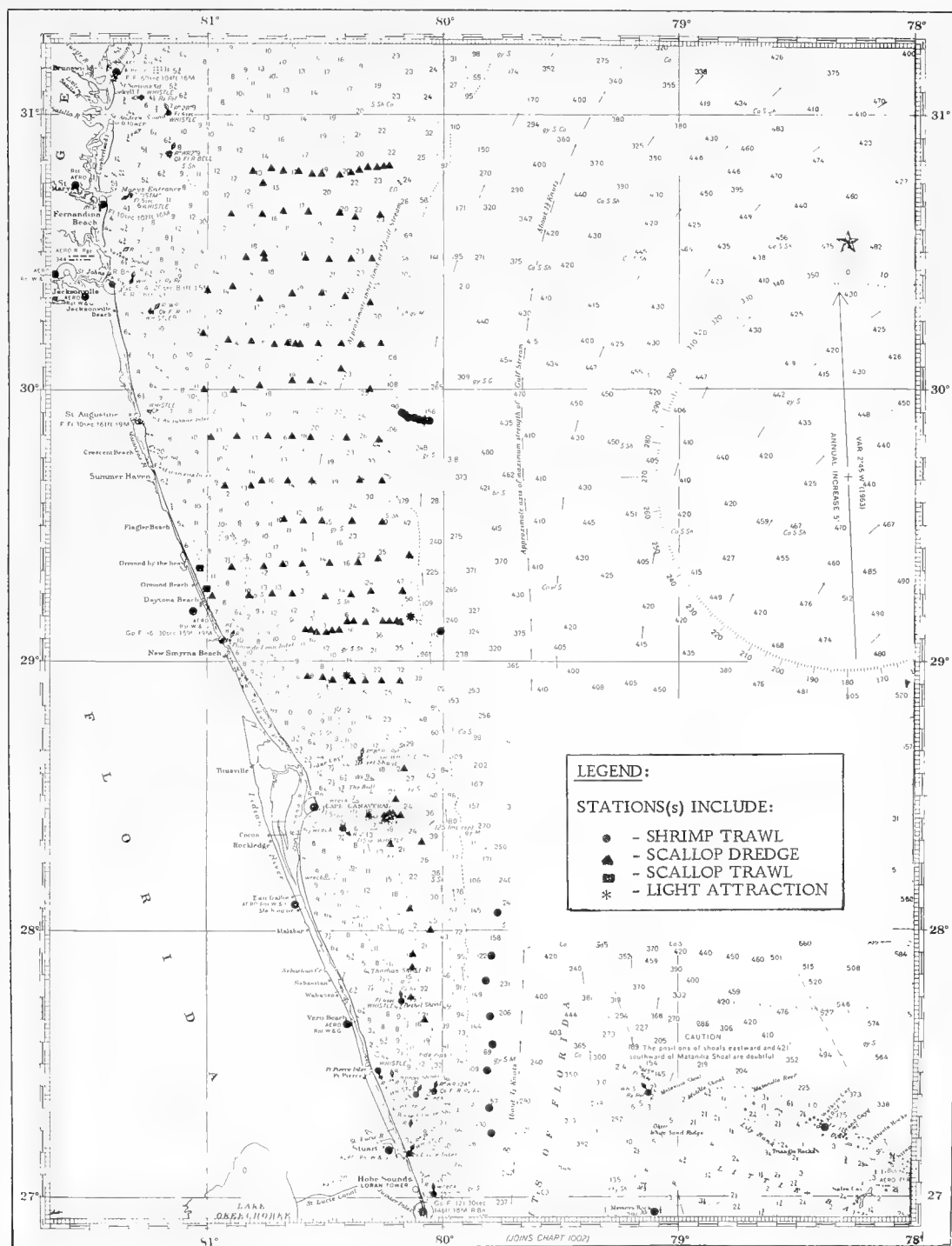
round herring (*Etrumeus* sp.) were caught in a 1½-hour tow with the British Columbia trawl rigged with 6-foot aluminum hydrofoil doors. Both trawls were equipped with an extension piece and cod end of ¾-inch stretched mesh webbing, 30-fathom legs and standard V/D rig.

Experimental midwater sampling with 5-foot long single funnel 28-inch diameter baited fish traps constructed of 1½-inch galvanized wire mesh failed to catch any fish.

Note: See Commercial Fisheries Review, August 1962 p. 38.

ROYAL-RED SHRIMP AND CALICO SCALLOP EXPLORATIONS CONTINUED:

M/V "Silver Bay" Cruise 42 (September 24-October 10, 1962): To obtain additional seasonal and geographical data on royal-red shrimp (Hymenopenaeus robustus) and calico



scallops (*Pecten gibbus*), and to provide assistance to the fishing industry, were the objectives of this cruise by the exploratory vessel Silver Bay of the U. S. Bureau of Commercial Fisheries. During the 17-day cruise, the vessel operated on the Continental Shelf along the southeast coast of the United States from Stuart, Fla., to St. Marys, Ga., and returned to its base at Brunswick, Ga., on October 10, 1962. This trip was similar to Cruise 41 completed on September 8, 1962.

A total of 23 drags was made on the royal-red shrimp grounds with 2-seam 60 foot and 4-seam 70 foot 2-inch-mesh trawls. Catches ranged up to 125 pounds (heads-off) 26-30 count royal-red shrimp and extended as far south as Stuart, Fla.

A total of 131 calico scallop dredging and trawling stations was completed between Bethel Shoal and St. Marys, Ga. Catches ranged up to 9 bushels of scallops per 15-minute drag. The yield of commercial size scallops ranged from 75 to 130 meats per pint. The larger catches were generally made between 14 and 20 fathoms. Small amounts of live scallops were taken as far north as latitude 30°47' N. (a few miles north and offshore from St. Marys River entrance), together with large quantities of dead shell which extends the scallop bed into Georgia waters.

Bottom temperatures were taken at most dredging stations. A larval net, towed at the surface during many stations, caught large numbers (up to 200) of larval and young swordfish and sailfish. Scallop shell stock and samples were provided for industry representatives and biologists and technologists of the U. S. Bureau of Commercial Fisheries.

Note: See Commercial Fisheries Review, November 1962 p. 43.



Sport Fishing

ANNUAL CATCH, 1960:

Over 600 million fish were taken by sport fishermen in 1960, according to estimates made by the U. S. Bureau of Sport Fisheries and Wildlife. The catch included 250 species of fish.



Standards

PUBLIC MEETINGS ON NEW GRADE STANDARDS FOR CERTAIN FISHERY PRODUCTS:

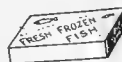
Public meetings to discuss four grade standards for certain fishery products were announced by the U. S. Bureau of Commercial Fisheries. The four standards to be considered are for frozen fried fish sticks, frozen fried fish portions, frozen raw breaded fish sticks, and frozen raw breaded fish portions. Those standards were developed by the Bureau's Technological Laboratory in Gloucester, Mass., and mark another important step in a constant effort by Government and industry to improve fishery products for the American public.

The standard for frozen fried fish sticks is a revision of the present standard for that product. The proposed revision reflects the improved quality of the product which is the result of using the fish stick standard adopted in 1956 and the fishery industry's use of modern production techniques.

The standard for frozen raw breaded fish portions has been amended to include new types of fish portions now marketed, and to simplify the breeding content requirements.

The standards for frozen fried fish portions and for frozen raw breaded fish sticks are new standards prepared to complete the complement of quality standards for breaded products made from fish blocks.

All interested parties were invited to attend the public hearings and comment on the proposed standards. The meetings were scheduled for January 7, 1963, at the Parker House in Boston, Mass.; January 9, 1963, at the Palmer House, Chicago, Ill., and January 11, 1963, at the St. Francis Hotel, San Francisco, Calif.



Tagging

WEST COAST FIRM FABRICATES TAGS FOR MARINE TURTLES AND FRESH-WATER FISH:

A Seattle research and development firm, specializing in fisheries and oceanographic instrumentation, is fabricating magnetic turtle tags for research in the Caribbean and

wire-dart fish tags for studies in New York State.

The turtle tags were made for the Caribbean Conservation Corporation and will be gold-plated cobalt-vanadium alloy two-hundredths of an inch by one-quarter inch, permanently magnetized. They were due to be inserted into the legs of silver-dollar-size turtles in the fall of 1962 with a hypodermic needle and a magnetic obturator (closing device). Once the needle, obturator, and tag are inserted, a magnetized ring worn by the researchers from the University of Florida touches the free end of the obturator, repelling the tag and allowing free withdrawal of both needle and obturator. The tagged turtles, often weighing 300 pounds as adults, will later be detected by a magnetometer which Oceanic Instruments also is fabricating.

The wire-dart fish tags for the New York State sports fishing research are of a hard-tempered stainless steel, 0.012-inch in diameter, approximately 2 inches long, bent in half and twisted, leaving $\frac{3}{16}$ -inch eyes at one of the ends to hold identifying tabs and, at the other ends, $\frac{3}{64}$ -inch dart points and $\frac{5}{32}$ -inch blunt ends, bent back at a 40-degree angle to reduce the possibility of workouts.

The tags will be inserted between the vertical interneural bones (just below the dorsal fin) of the fish in a manner which will allow the tabs to stream in-plane with their backs.

In addition, this firm's device for detecting radioactively-tagged herring was used in Washington Bay, Alaska, during the summer of 1962 and several tags were recovered from fish tagged by the U. S. Bureau of Commercial Fisheries in 1960 and 1961.



Tuna

REPORT ON EASTERN PACIFIC TUNA REGULATIONS HEARING:

A public hearing was held November 19, 1962, in San Diego to afford interested members of the United States tuna industry an opportunity to present orally their views on the regulations proposed for adoption by the U. S. Department of the Interior to control yellowfin tuna fishing by domestic tuna fish-

ermen in the Eastern Pacific and to restrict imports of tuna from countries which may fail to cooperate in carrying out the conservation recommendations of the Inter-American Tropical Tuna Commission. That Commission has recommended a conservation program for the yellowfin tuna resources of the Eastern Pacific Ocean. The hearing was attended by approximately 45 individuals, consisting of several tuna fishermen, representatives of boat owners, fishermen's unions, cannery operators, the California Department of Fish and Game, and the Interior Department.

A number of industry representatives contributed helpful suggestions for revising the regulations as originally proposed in the Notice of Proposed Rule Making published in the Federal Register of October 18. Industry representatives expressed concern over the proposed vessel registration system and the requirement for weekly radio reports. Those representatives also outlined a number of problems which might be encountered in attempting to observe the limitation of 15 percent by weight of yellowfin taken as an incidental catch during the closed season on that species. Aside from those points, which the industry representatives urged be given further study, the regulatory system proposed appeared to be generally acceptable.

The industry representatives were informed that the record would be kept open until December 19, 1962, for the receipt of any additional written material which they might desire to submit for consideration. It will be recalled that the Department's regulations cannot be placed in effect until all countries which engage in fishing in the area on a meaningful scale agree upon a date for the simultaneous application of conservation measures which will be applicable to the vessels of the several countries involved. Developments to date indicate that the recommended yellowfin tuna conservation regime cannot be implemented before early summer of 1963.

* * * * *

ALBACORE MIGRATION PATTERN SHIFTS IN EASTERN PACIFIC DUE TO WARMER WATER:

U. S. Navy picket vessels, cooperating with the U. S. Bureau of Commercial Fisheries Biological Laboratory at San Diego, Calif., caught more than 675 albacore in

1962; and 8 of those fish were taken at 50° N. latitude. This is the farthest north albacore have been taken in quantity by picket vessels since the program started three years ago.



Pacific albacore tuna (*Thunnus germo*).

Catches that far north are believed to be the result of the shift of the migratory route of incoming albacore schools to the north because of the warmer water covering much of the central North Pacific in 1962.



U.S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, OCTOBER 1962:

During October 1962, a total of 25 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 28 in October 1961. There were 30 documents cancelled for fishing vessels in October 1962 as compared with 26 in October 1961.

Table 1—U.S. Fishing Vessels^{1/}— Documents Issued and Cancelled, by Areas, October 1962 with Comparisons

Area (Home Port)	October		Jan.-Oct.		Total 1961
	1962	1961	1962	1961	
.....(Number).....					
Issued first documents ^{2/} :					
New England	1	1	25	28	33
Middle Atlantic	-	-	2	11	12
Chesapeake	6	14	35	62	75
South Atlantic	3	2	40	42	47
Gulf	7	4	94	91	100
Pacific	7	6	122	147	149
Great Lakes	1	1	4	12	12
Puerto Rico	-	-	-	2	2
Total	25	28	322	395	430
Removed from documentation ^{3/} :					
New England	-	1	19	16	20
Middle Atlantic	2	1	33	24	34
Chesapeake	3	-	22	27	28
South Atlantic	6	4	35	25	30
Gulf	9	7	95	84	103
Pacific	10	15	92	86	112
Great Lakes	-	-	18	13	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	30	28	318	275	341
1/For explanation of footnotes, see table 2.					

^{1/}For explanation of footnotes, see table 2.



The skeleton of a new shrimp trawler. Like most shrimp trawlers in the fleet, this has a wooden hull.

Table 2—U.S. Fishing Vessels—Documents Issued and Cancelled, by Tonnage Groups, October 1962

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
	.....(Number).....	
5-9	5	9
10-19	13	13
20-29	-	2
30-39	4	2
40-49	-	2
50-59	-	1
70-79	1	-
80-89	1	-
110-119	-	1
540-549	1	-
Total	25	30

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

^{2/}Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 16 in 1962; 1 in 1961; 1 in 1955; and 7 prior to 1951. Assigned to areas on the basis of their home ports.

^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

* * * * *

NEW FISHERY RESEARCH VESSEL FOR BUREAU OF COMMERCIAL FISHERIES:

Albatross IV, the new fishery-oceanographic research vessel of the Bureau of Commercial Fisheries was scheduled for commissioning the latter part of December



The new fishery-oceanographic research vessel of the U. S. Bureau of Commercial Fisheries--the Albatross IV.

1962 at the Bureau's new dock facilities at Woods Hole, Mass. Her first assignment will be along the George's Bank fishing grounds in the North Atlantic Ocean.

The modern ocean-going research vessel has scientific facilities rivaling those of many shore laboratories and represents a new step forward in United States oceanographic studies. In commenting on the vessel, Secretary of the Interior Stewart L. Udall said, "We have lagged behind other nations that have provided their fishing industry with the latest in equipment and scientific knowledge. We are determined to overcome that lead."

The Albatross IV is a 187-foot single-screw stern trawler, the first of its kind ever built in the United States. It will allow scientists to (1) chart the distribution and abundance of groundfish and scallops, (2) study seasonal changes in fish stocks, (3) locate bottom fish which serve as food for groundfish, and (4) uncover plankton population centers.

Note: See Commercial Fisheries Review, July 1962 p. 42.



U. S. Foreign Trade

IMPORTS OF FRESH OR FROZEN TUNA THROUGH THE U. S. CUSTOMS DISTRICT OF PUERTO RICO, JANUARY-JUNE 1962:

During January-June 1962, 23.9 percent of the total U. S. imports of fresh or frozen

tuna entered through the U. S. Customs District of Puerto Rico.

Imports of Fresh or Frozen Tuna Through the U. S. Customs District of Puerto Rico by Country of Origin, January-June 1962	
Country of Origin	Quantity Pounds
British West Africa and Sierra Leone	12,782,189
Japan	9,042,933
Peru	6,301,004
Western Africa ¹ /	3,167,465
Ecuador	2,471,840
Australia	1,106,639
Other countries	550,947
Total	35,423,017
¹ /Includes Togo, Guinea, Mali, Senegal, Ivory Coast, Dahomey, Upper Volta, Mauritania, and Niger.	

Note: Imports into Puerto Rico from foreign countries are reported as United States imports by the U. S. Bureau of the Census. But shipments between Puerto Rico and the United States or between Puerto Rico and the territories and possessions of the United States are not reported as United States imports by the Bureau of the Census.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 3, 1962, amounted to 47,404,873 pounds (about 2,257,375 std. cases), according to data compiled by the Bureau of Customs. This was 3.6 percent more than the 45,545,956 pounds (about 2,168,855 std. cases) imported during January 1-October 28, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the $12\frac{1}{2}$ -percent rate of duty is limited to 59,059,014 pounds

(about 2,812,000 std. cases of 48 8-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

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EDIBLE FISHERY PRODUCTS, OCTOBER 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in October 1962 were down 10.1 percent in quantity but up 4.9 percent in value from those of the previous month. The drop in quantity was mainly due to a large decline in imports of frozen tuna (decline mostly from Japan, Peru, British West Pacific Islands, and Ecuador). The decline was partly offset by a large increase in imports of frozen shrimp (increase mostly from Mexico). There was also some increase in imports of other higher-priced products such as swordfish filets, canned sardines not in oil, canned oysters, frozen spiny lobsters, frozen sea scallops, frozen frog legs, and frozen ocean perch filets.

U. S. Imports and Exports of Edible Fishery Products, October 1962 with Comparisons								
Item	Quantity				Value			
	Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
	1962	1961	1962	1961	1962	1961	1962	1961
	(Millions of Lbs.)				(Millions of \$)			
Imports:								
Fish & Shellfish:								
Fresh, frozen & processed 1/	101.5	93.6	980.9	838.2	36.4	31.9	329.9	268.7
Exports:								
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen)	3.6	2.6	27.3	20.0	2.0	1.2	11.9	10.2
1/Includes pastes, sauces, clam chowder and juice, and other specialities.								

Compared with the same month in 1961, the imports in October 1962 were up 8.4 percent in quantity and 14.1 percent in value. There was a sizable increase this October in imports of fish blocks and slabs, canned sardines not in oil, canned oysters, and frozen shrimp. But imports were down for fresh and frozen salmon, canned salmon, frozen albacore tuna, canned tuna in brine, canned sardines in oil, and canned crab meat.

sardines in oil and not in oil, frozen shrimp, and sea scallops. Imports were down for the following products: had-dock filets, fresh and frozen salmon (mostly from Canada), canned albacore tuna in brine, canned bonito and yellowtail, and canned crab meat.

Exports of processed fish and shellfish from the United States in October 1962 were up 44.0 percent in quantity and 81.8 percent in value as compared with the previous month. Exports were up in October 1962 for all important processed fishery products except canned sardines not in oil. There was a large increase in exports of canned squid (mostly to Greece and the Philippines) and the higher-priced canned salmon (mostly to the United Kingdom).

Compared with the same month in 1961, the exports in October 1962 were up 38.5 percent in quantity and 66.7 percent in value. There was a big increase this October in exports of canned salmon and canned squid. Exports were also up for canned sardines in oil and canned shrimp. But exports were down for canned mackerel and canned sardines not in oil.

Processed fish and shellfish exports for the first ten months of 1962 were up 37.0 percent in quantity, but the value was up only 16.7 percent as compared with the same period of 1961. Exports of the lower priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, canned sardines in oil, and canned sardines not in oil. But exports were down for canned shrimp (decline mostly in exports to Canada and the United Kingdom). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

* * * * *

IMPORTS OF PRODUCTS OF AMERICAN FISHERIES, 1960-1961 AND JANUARY-APRIL 1962:

In 1961, there was a sharp increase in the quantity of tuna from United States flag vessels that was transshipped to the United States through foreign countries. Also, a significant amount of shrimp from United States flag vessels was transshipped to the United States for the first time in January-April 1962.

Table 1 - U. S. Imports of Products of United States Fisheries, 1960-61 and January-April 1962

Item	Jan.-Apr. 1962		1961		1960	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Pounds	US\$ 1,000	1,000 Pounds	US\$ 1,000	1,000 Pounds	US\$ 1,000
Halibut	170.9	53.8	1,327.0	415.2	1,008.9	188.4
Tuna (yellowfin and skipjack)	8,938.8	1,132.6	8,938.8	2,106.1	1,660.0	208.9
Shrimp	173.1	32.6	-	-	-	-
Other fish and shellfish	14.6	3.5	-	-	-	-
Total	9,297.4	1,222.5	18,324.7	2,521.3	2,668.9	397.3

Source: Compiled by U. S. Tariff Commission from data furnished by the U. S. Bureau of the Census.

In the first ten months of 1962, imports were up 17.0 percent in quantity and 22.8 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed this year for most imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs, frozen tuna (increase mostly from Japan and Peru), canned tuna in brine other than albacore (increase mostly from Japan), canned

In April 1962, shrimp caught by United States flag vessels was transshipped to the United States from Guatemala City, Guatemala, and tuna was transshipped from Mancora and Paita, Peru, and Tema, Ghana.

Table 2 - Imports of Products of United States Fisheries, April 1962

Product and Transshipping Country	Quantity	Value	U. S. Customs Port of Entry	Method of Transport
	1,000 Lbs.	US\$ 1,000		
Shrimp, Frozen:				
Guatemala . . .	25.1	8.8	Houston, Tex.	Airborne
Tuna, Frozen:				
Yellowfin:				
Peru	3,181.5	437.2	San Diego, Calif.	Steamship
Ghana	13.6	1.6	Mayaguez, Puerto Rico	"
Skipjack:				
Peru	410.4	47.2	San Diego, Calif.	"
Ghana	124.5	12.5	Mayaguez, Puerto Rico	"
Total transshipments	3,755.1	507.3		

Source: U.S. Bureau of the Census.

* * * * *

TREND IN IMPORTS OF FISHERY PRODUCTS DURING 1961:

The value of annual imports of fishery products entering the United States rose to a new high in 1961. In that year, 112 countries shared in the United States market for fishery products. The value of fishery products imported was \$397,058,000, a rise of 10 percent over the 1960 value; the quantity remained about the same. Imports of edible fishery products were valued at \$335,757,000; inedible products, \$61,301,000.

Table 1 - Value^{1/} of United States Imports of Fishery Products by Selected Countries of Origin, 1957-61

Country	1961	1960	1959	1958	1957
	(US\$1,000)				
Canada	108,035	102,878	101,967	107,005	97,404
Japan	88,261	85,256	96,226	84,872	77,202
Mexico	45,766	36,705	32,869	28,005	25,248
Peru	16,729	14,270	16,374	10,907	9,167
Norway	15,101	12,506	16,405	12,087	11,144
So. Africa Repub.	14,468	12,030	12,090	9,332	8,554
Australia	10,856	9,839	8,180	7,665	7,766
Ireland	11,528	9,306	10,000	8,775	6,022
Panama	6,707	5,767	6,458	5,852	6,291
Portugal	6,525	5,289	5,452	5,177	5,507
Ecuador	4,619	4,467	4,159	3,510	3,075
Denmark	5,246	4,342	8,239	5,728	3,463
El Salvador	5,510	4,215	1,297	660	60
West Germany	4,160	4,100	1,814	1,805	1,008
Brazil	5,074	3,916	3,002	2,359	2,337
Cuba	1,793	3,901	4,810	5,542	6,282
Chile	2,089	2,630	1,282	2,007	1,130
Netherlands	1,736	2,562	2,628	1,509	2,496
India	2,777	2,363	2,239	1,547	1,407
France	2,087	2,317	2,230	1,169	1,139
United Kingdom	2,309	1,759	2,388	1,787	1,540
Angola	500	267	3,023	2,065	1,046
Other 2/	35,182	29,380	23,368	17,806	18,155
Total	397,058	360,065	366,500	327,171	297,443

1/Value at the foreign port of shipment.
2/90 countries in 1961.

Trends by Countries: Canada, Japan, and Mexico (leading suppliers of fishery products to the United States) accounted for 61 percent of the value of fishery imports (see table 1). Canada supplied 27 percent, Japan 22 percent, and Mexico 12 percent. Peru, Norway, Republic of South Africa, Australia, and Iceland were important suppliers with trade valued over \$10,000,000 each. Imports from

Panamá, Portugal, Denmark, El Salvador, and Brazil were valued over \$5,000,000 each.

Canada, with products valued at \$108,035,000, continued to be the principal supplier of fisheries products to the United States market. This value represented a gain of 5 percent over 1960. Fresh or frozen fish and shellfish products accounted for the largest part.

Canada Supplied:		
Fresh or frozen (total):		\$ 83,657,000
Lobster	\$14,570,000	
Fresh-water fish	12,173,000	
Fish blocks	14,294,000	
Groundfish fillets	11,581,000	
Salmon	5,860,000	
Halibut	6,133,000	
Flounder fillets	5,210,000	
Fresh-water fillets	5,404,000	
Other fresh or frozen	8,432,000	
Canned lobster		4,682,000
Fish meal and scrap		3,544,000
Cod, haddock, etc., pickled or salted		7,420,000
Other fishery products		8,732,000
Grand Total		\$ 108,035,000

Japan: The value of fishery imports from Japan was \$88,261,000, an increase of more than 3 percent over 1960. Tuna and pearls were the leading commodities.

Japan Supplied:		
Fresh or Frozen:		
Albacore tuna		\$ 9,671,000
Other tuna		11,088,000
Shrimp		1,201,000
Swordfish		6,391,000
Fresh-water trout		776,000
Frog legs		740,000
Canned:		
Light meat tuna in brine		11,269,000
White meat tuna in brine		7,487,000
Salmon		2,667,000
Crab meat		5,756,000
Clams		972,000
Pearls, cultivated		16,136,000
Other		14,107,000
Total		\$88,261,000

Mexico ranked third as a supplier of fishery products to the United States. Shrimp was the principal commodity. Mexico supplied 58 percent of the total value of all United States shrimp imports.

Mexico Supplied:		
Shrimp		\$40,094,000
Other		5,672,000
Total		45,766,000

Table 2 - Value^{1/} of United States Imports of Fishery Products by Area of Origin, 1961

Area	Edible	Inedible	Total
	(US\$1,000)		
North America	169,063	5,878	174,941
Asia	70,007	25,690	95,697
Europe	44,587	9,463	54,050
South America	17,456	17,535	34,991
Africa	19,118	2,252	21,370
Oceania	15,526	483	16,009
Total	335,757	61,301	397,058

1/Value at the foreign port of shipment.

Area of Origin: During 1961, North American countries continued to be the principal source of supply for fishery products imported into the United States (table 2). Products valued at \$174,941,000 (or 44 percent of total fishery imports) came from North American sources. Imports from Asian countries were second; Europe, third.

Trends by Commodities: The value of shrimp, lobsters, and groundfish imports reached record levels. Other leading products imported were: frozen and canned tuna, sardines, crab meat, fish meal, and pearls (see table 3).

Shrimp: The value of shrimp imports increased to a total of \$68,538,000, 22 percent over 1960, and the highest on record. Increased shipments were from Mexico, Panama, El Salvador, Ecuador, Iran, India, and Pakistan.

Lobsters: Imports of fresh or frozen northern lobster comprised 30 percent of the total fresh or frozen lobster imports; spiny lobsters made up 70 percent. The South Africa Republic supplied 37 percent of the spiny lobster tails. Australia was second with 29 percent. In 1961, fresh or frozen lobster imports were valued at \$49,040,000 and canned lobster imports at \$4,779,000.

Groundfish: Imports of groundfish fillets and blocks rose steadily over the past six years; both products showed significant increases in 1961. Imports of blocks and slabs increased by 32 percent. Canadian shipments were 61 percent of total imports of groundfish fillets and blocks; Iceland also supplied 23 percent; Norway and Denmark each about 5 percent.

Tuna: The value of frozen tuna imported was \$30,228,000; canned tuna, \$22,175,000. Japan supplied 52 percent of the value of fresh and frozen tuna and 85 percent of the canned tuna.

Table 3 - Value ^{1/} of United States Imports of Fishery Products by Selected Commodities, 1957-61					
Commodity	1961	1960	1959	1958	1957
.....(US\$1,000).....					
Edible Products:					
Fresh or Frozen:					
Shrimp	68,538	56,380	52,306	43,162	35,415
Tuna	30,228	31,713	29,728	25,377	16,765
Groundfish fillets and blocks ...	42,595	33,265	38,759	30,431	27,417
Lobster	49,039	44,794	38,635	35,661	36,827
Other	63,547	61,845	60,940	63,243	55,575
Total fresh or frozen	253,947	227,997	220,368	197,874	171,999
Canned:					
Tuna	22,175	19,142	21,688	16,882	17,002
Salmon	3,545	7,541	1,130	11,130	9,470
Sardines	12,543	9,115	8,370	8,564	8,957
Crab meat	5,780	5,514	7,947	6,116	6,254
Lobster	4,779	5,239	6,441	3,952	5,017
Other	17,530	16,067	17,083	15,561	14,645
Total	66,352	62,618	72,659	62,346	61,345
Other edible products	15,458	16,765	18,006	19,992	17,612
Inedible Products:					
Fish meal	16,740	11,068	15,884	11,335	9,717
Pearls	16,925	14,563	13,678	10,944	9,989
Other	27,636	27,054	25,905	24,680	26,781
Total inedible	61,301	52,685	55,467	46,959	46,487
Total fishery imports	397,058	360,065	366,500	327,171	297,443

^{1/}Value at the foreign port of shipment.

Fish Meal: The quantity of fish meal imported during 1961 was valued at \$16,740,000, an increase over 1960. Peru,

Canada, Chile, and the South Africa Republic remained the leading suppliers.

Duties Collected: Duties collected on imports of fishery products into the United States during 1961 were \$16,904,000 or 7 percent higher than in 1960. Duties collected and the average ad valorem equivalents for the years 1957-61 are listed below:

Year	Duties Collected	Average Ad Valorem Equivalent Percent
1961	16,904,000	4.3
1960	15,857,000	4.4
1959	17,737,000	4.8
1958	16,645,000	5.1
1957	15,955,000	5.4



Vessel Mortgage Insurance Program

STEEL TRAWLER FOR NEW ENGLAND FISHERY BEING BUILT UNDER PROGRAM:

The first large steel trawler (the Massachusetts) to be added to the Boston, Mass., fishing fleet in 11 years has been constructed under an insured loan contract approved by the Fish and Wildlife Service's Bureau of Commercial Fisheries, the U. S. Department of the Interior announced on November 17, 1962.



Fig. 1 - The large steel trawler Massachusetts, the first of its type to be added in 13 years to the Boston fishing fleet.

The insured loan is for about \$225,000 and was made to the Boston Fishing Boat Company, Inc., under a contract with the John Hancock Mutual Life Insurance Company. The total cost is to be approximately \$450,000, of which \$150,000 will be covered by Federal Government subsidy. An original investment of \$120,000 was made by dealers and merchants on the Boston Fish Pier who formed a corporation (Boston Fishing Boat, Inc.) as evidence of their confidence in the potential growth of the Boston fishing industry. Additional funds were realized by a loan of \$225,000 from the John Hancock Mutual Insurance Company. This loan is guaranteed by the United States Government.

The 124-foot trawler is being built by the Sturgeon Bay Shipbuilding and Dry Dock Com-

pany, Sturgeon Bay, Wis., and will be used in the New England groundfish fishery. When the vessel is completed and accepted, the insured construction loan will be replaced by a contract of mortgage insurance with the U. S. Bureau of Commercial Fisheries. Powered by an 800-hp. Diesel engine with a cruising speed of 13 knots, the trawler has a capacity for 300,000 pounds of fish. Among the electronic devices carried are Loran, fish finder, depth finder, radar, radio, etc.



Fig. 2 - Christening of the steel trawler *Massachusetts* about a week before it sailed on November 22, 1962, from Sturgeon Bay, Wis.

The Boston Fishing Boat, Inc. was organized by Thomas A. Fulham, who is associated with Fulham Brothers and the Boston Fish Market Corporation. There are 29 principal shareholders in the Boston Fishing Boat Company. The owners are firms and individuals in the Boston area engaged in producing and marketing fishery products or in businesses related to or supplying the commercial fisheries. A sister-ship (*Sturgeon Bay*) is being built and is expected to arrive in Boston early in 1963. It is expected that 7 million pounds more fish per year will be landed at Boston by the two new trawlers.

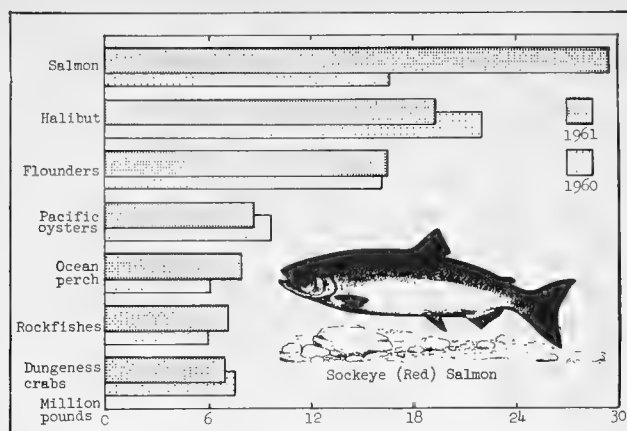


Washington

FISHERY LANDINGS, 1961:

Landings of fish and shellfish at Washington State ports during 1961 amounted to 120.4 million pounds with an ex-vessel value of \$18.7 million. Compared with 1960, this was a gain of 7.3 million pounds or 6 percent in quantity, and \$3.2 million or 20 percent in value. The sharp increase in the catch of salmon (up 13.4 million pounds) was largely responsible for the year's greater production.

Salmon, with 29.9 million pounds, was the leading species. Halibut was next with a catch of 19.4 million pounds. There were additional landings of this species by the Canadian hali-



State of Washington landings of certain fish and shellfish, 1961 and 1960.

but fleet totaling 2.5 million pounds in 1961 and 4.5 million pounds in 1960. Flounders ranked third in quantity during 1961 with 16.5 million pounds, and Pacific oysters fourth with 8.6 million pounds. Ocean perch, rockfishes, and Dungeness crabs followed with 7.9, 7.2, and 7.1 million pounds, respectively. Those 7 varieties of fish and shellfish comprised 80 percent of the 1961 total Washington landings.

* * * * *

SALMON FARM PROGRAM PROVES EXPENSIVE:

The "fish farm," or controlled natural rearing area, has been one of the most recent developments in salmon propagation in the Northwest. The technique to rear a variety of warm-water fish has been used for centuries in various countries. Since 1957, some 29 areas involving 1,600 acres of "cold" water have been placed in salmon production in the State of Washington.

Those controlled natural rearing areas encompass both fresh- and salt-water lakes and lagoons. In developing them, all competitive and predator fishes are removed. Silver (coho) and chinook salmon are the principal species involved in the program, although experimental plants of pink and chum salmon have also been made.

In a report before the annual American Fisheries Society meeting in September 1962, the Assistant Director of the Washington Department of Fisheries stated that it is too early to say whether those areas are proving successful. Results to date, although highly encouraging for silver, indicate that many problems remain to be solved. Juve-

nile silver salmon survival has varied widely (2 to 46 percent) in different rearing impoundments, and in the same ponds in different years.

Chinook salmon results have been less promising, as the fingerlings display an inability or reluctance to migrate from the rearing ponds. For success, it is apparent that the ponds must be constructed so as to be completely drainable.

The State of Washington fishery biologist noted that the fish farm program, once promoted as an inexpensive way to raise salmon, has turned out to be more expensive than anticipated. "Including necessary sealing and water and fish control structures, those areas are currently costing as high as \$10,000 per acre to develop. Just what an adequate operating budget will ultimately be is yet to be determined."

He concluded: "With continued work conducted in a careful and logical manner, fish farming and artificial spawning areas may become valuable supplements to natural production. In immediate cases where there is no choice, fisheries agencies may have to gamble on such facilities as replacement for inundated spawning areas . . . but, those agencies, in response to their accepted responsibilities, cannot support a new and untried method of salmon propagation as an immediate and complete replacement for vast natural spawning areas."

Note: See Commercial Fisheries Review, July 1962 p. 43.



Wholesale Prices

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in November 1962 edged slightly downward (dropped 0.6 percent from October) for the second consecutive month. The November decline was about the same as from September to October 1962 following a 2-month period of price increases for western halibut, and fresh and frozen shrimp. As compared with November a year earlier, prices were up 4.0 percent because of higher prices for most of the fishery products included in the index except canned fish.

The drawn, dressed, or whole finfish subgroup this November was up only slightly (increased 0.1 percent) from the previous month, but was still 12.5 percent higher than in November 1961. Higher prices this November for large drawn fresh haddock at Boston (up 6.1 percent) and Great Lakes yellow pike at New York City (up 13.8 percent) more than offset the 1.3-percent drop for frozen dressed king salmon at New York City and the 6.9-percent drop for fresh Lake Superior whitefish (wholesale price at Chicago down 5 cents a pound). As compared with November 1961, prices were up sharply for all items in the subgroup, but Lake Superior whitefish prices were down 20.6 percent.

Higher prices this November for fresh small haddock fillets at Boston (up 3 cents a pound or 7.9 percent) were responsible for the increase of 0.2 percent from October to November in the fresh processed fish and shellfish subgroup index. Fresh shrimp prices at New York City were down slightly (dropped 1 cent a pound) from the previous month, but fresh shucked oysters (standards) at Norfolk remained at the October price level. The subgroup index this November was up 9.2 percent from a year earlier because of higher prices for fresh small haddock fillets (up 20.6 percent) and South Atlantic fresh shrimp (up 18.8 percent) at New York City.



Fig. 1 - Unloading a small dragger at the State Pier, Gloucester, Mass.

Processed frozen fish and shellfish prices in November 1962 were down 1.6 percent from the previous month because of a 4.0-percent drop in frozen shrimp prices (down 4 cents a pound) at Chicago. All other items in the subgroup were higher priced from October to November. Prices at Boston from October to November increased 7.2 percent for ocean perch fillets, 3.8 percent for flounder fillets, and 1.4 percent for haddock fillets. As compared with November 1961, the subgroup index in November 1962 was up 14.7 percent. Prices were up for frozen shrimp by 21.3 percent, ocean perch fillets by 12.6 percent, and other frozen fillets by 4 to 6.5 percent.



Fig. 2 - View looking north on South Street in the salt-water section of New York City's Fulton Fish Market.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1962 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			Nov. 1962	Oct. 1962	Nov. 1962	Oct. 1962	Sept. 1962	Nov. 3/ 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					118.3	119.0	119.8	113.7
<u>Fresh & Frozen Fishery Products:</u>					123.7	124.3	125.6	110.2
<u>Drawn, Dressed, or Whole Finfish:</u>					120.8	120.7	125.0	107.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.11	87.2	82.2	78.1	75.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.44	129.6	129.6	126.6	103.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.96	.98	134.5	136.2	146.3	118.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.68	.73	100.7	108.2	98.5	126.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.54	.48	88.5	77.8	91.7	77.8
<u>Processed, Fresh (Fish & Shellfish):</u>					124.0	123.8	123.1	113.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.38	99.6	92.3	86.2	82.6
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.04	1.05	121.9	122.5	125.4	102.6
Oysters, shucked, standards	Norfolk	gal.	7.75	7.75	130.7	130.7	126.5	132.8
<u>Processed, Frozen (Fish & Shellfish):</u>					120.7	122.7	122.8	105.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.41	.40	103.9	100.1	100.1	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.36	107.0	105.5	101.1	102.6
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.32	118.3	110.4	110.4	105.1
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.09	1.13	128.7	134.0	136.4	106.1
<u>Canned Fishery Products:</u>					109.4	110.2	110.2	120.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	25.50	25.50	111.1	111.1	111.1	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	5.25	101.6	118.5	118.5	110.6
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.11	119.4	116.9	116.9	157.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs.

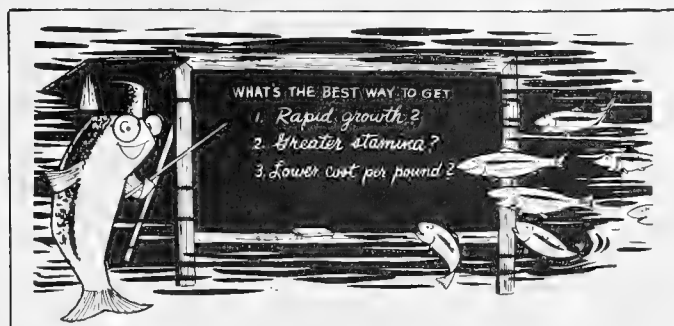
These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/Recomputed to be comparable to 1957-59=100 base indexes.

Canned fishery products prices in November 1962 dropped slightly (down 0.7 percent) from the previous month, and were 8.9 percent lower than in November 1961. The drop in the subgroup index for canned fish from October to November was not significant since it was caused by lower prices for California canned sardines, a product on which stocks were virtually exhausted and unlikely to be replenished as a result of the failure of the 1962 California sardine season. By the end of November, sardine landings at California were the lightest on record, and were down to about half the previous record low in 1953. Prices this November for canned tuna and canned Pacific salmon were un-

changed from the previous month, but canned Maine sardine prices rose 2.1 percent due to a spurt in demand for the back-to-normal 1962 pack of over 2 million cases. As of the end of November, the 1962 California canned tuna pack totaled 10.5 million cases, or 0.5 million cases more than for the same period in 1961. The 1962 Alaska salmon pack was better than anticipated. As compared with a year earlier, canned fish prices were lower for all products in the subgroup. Prices for canned Maine sardines this November were down 24.4 percent from the same month in 1961 when stocks were critically low because of a very light pack.





International

NORTH PACIFIC FISHERIES COMMISSION

REPORT ON MEETING:

The International North Pacific Fisheries Commission (whose members represent Canada, Japan and the United States) concluded its Ninth Annual Meeting in Seattle, Wash., on November 17, 1962. Decisions and recommendations were made on a number of vital problems affecting North Pacific fishing operations of the three countries. The Commission's recommendations will not take effect until approved by the member governments.

The meetings, which covered a span of four weeks, brought together many of the top administrators and scientists in the field of fisheries from the three nations.

The Commission did not recommend any changes in the salmon stocks under abstention by Japan and, in the case of the Bering Sea, by Canada as well. This means that Japanese mothership fleets will continue to operate only west of the salmon abstention line, which is located provisionally at 175° W. longitude. Turning to the question of the location of the salmon abstention line itself, the Commission was unable to consider any proposals for changes in the location of the abstention line, since the terms under which the line could be changed have not been agreed to by the three governments concerned.

The Commission studied the problems of salmon conservation in high-seas areas of intermingling—that is, in the extensive ocean areas where salmon from Asia intermingle with salmon originating in certain parts of North America. The Commission has recommended to its member governments that full consideration be given to the conservation needs of the salmon resources when future fishing regulations are prepared. Adequate conservation regulations for the salmon stocks were recommended for special attention.

The Commission reviewed the great progress being made in research on the distribution and movements of the various salmon stocks on the high seas. It took steps to assure the full reporting and publication of the results of the large and highly successful research program carried out under its auspices by the scientific agencies of the three countries.

The Commission also studied the evidence regarding the continued qualification of herring stocks for abstention by Japan, and recommended to its member governments that Japan no longer be required to abstain from fishing the herring off the west coast of Queen Charlotte Islands. It arranged for a study, by a group of scientists of the three countries, of the requirements for research on the North American herring stocks not now under abstention to assess the need for conservation measures.

The Commission gave prolonged study to the halibut stock of the eastern Bering Sea, which Japan has been obliged to abstain from fishing under the provisions of the North Pacific Treaty. The Commission determined on the basis of additional data and analysis during the past year that the halibut stock of the eastern Bering Sea no longer meets all of the requirements for continued abstention set by the Treaty. Therefore, the Commission is recommend-

ing to its member governments that Japan no longer be required to refrain from fishing this stock.

In conjunction with the above action, the Commission established a special group of scientists to consider the problems of halibut conservation which will arise when the eastern Bering Sea halibut are open to fishing by Japan. In addition, because of the extreme importance of the conservation aspects of this proposed change, the Commission has scheduled an interim meeting to deal with this subject. The meeting will begin on February 5, 1963, in Tokyo.

The Commission gave much attention to the subject of Japanese plans for fishing for groundfish stocks, other than halibut, in the eastern North Pacific Ocean south of the Aleutians and in the Gulf of Alaska. Under the terms of the Convention Japan, while obligated to abstain from fishing halibut in those areas, is under no obligation to refrain from fishing for other stocks of groundfish. Japan is naturally desirous of fishing for groundfish other than halibut in the eastern North Pacific.

There was extensive discussion of the possible effect of bottom trawling on halibut stocks. Japan indicated plans to send one bottom trawler to the above area in the winter of 1962/63 and a maximum of four bottom trawlers to the area during the summer of 1963. The Japanese bottom trawling operation in the area in 1963 will be of an experimental nature, with full cooperation in observations, collection of data, discussion and reporting of results, etc., to be carried on by scientists of the three nations represented in the Commission. The purpose of the observations is to determine under what conditions and to what extent trawling for other groundfish with conventional bottom trawls may be injurious to the stocks of halibut and methods of operation by which any damage to halibut stocks can be minimized. All halibut taken will be returned to the sea immediately. Opportunity will be provided for Canadian and United States scientists, upon request, to be aboard the Japanese experimental vessels. The Japanese bottom trawling vessels will exercise great care in areas where high densities of halibut are encountered.

A group of scientists from the three countries, appointed to study questions in connection with the effects of trawling on halibut, has already met and given preliminary study to the organization of the research program.

In addition to the Japanese bottom trawlers, as mentioned above, Japan may license some off-bottom-type trawlers for experimental operation in the eastern North Pacific. There is no evidence that trawls of this type cause any damage to the halibut stocks. However, opportunity will be provided for scientists from the three countries to study the activities of these vessels as well.

TUNA

INTER-GOVERNMENTAL CONFERENCE ON YELLOWFIN CONSERVATION IN EASTERN PACIFIC:

The Inter-Governmental Conference on Conservation of Yellowfin Tuna in the Eastern Pacific was held at San Jose, Costa Rica, on November 7 and 8, 1962. The conference failed to reach agreement upon a date as of which all countries fishing in the regulatory area in the Eastern Pacific on a meaningful scale would apply conservation measures

International (Contd.):

to the vessels and persons subject to the jurisdiction of the several countries involved. This inability to arrive at an "agreed date" for the application of conservation measures resulted in part from the fact that Peru and Guatemala did not send representatives to the meeting. Moreover, several countries were represented only by observers who were not authorized to commit their countries in positive terms to establishing and carrying out a conservation program.

The countries represented by observers were: Colombia, Chile, Ecuador, and Japan. Those countries which had authorized delegations in attendance were: Costa Rica, Mexico, Nicaragua, El Salvador, Panama, and the United States. A commitment was not required from all of the countries mentioned since several currently do not fish tuna in the regulatory area on a meaningful scale within the meaning of the requirement for an "agreed date" imposed by United States Public Law 87-814. Of the countries represented at the meeting, only Costa Rica, Japan, and the United States had initiated plans to implement the recommendation of the Inter-American Tropical Tuna Commission for a program to conserve the yellowfin tuna resources of the Eastern Pacific Ocean.

The meeting provided an opportunity to emphasize the need for conserving the yellowfin tuna resources and served as an initial step toward encouraging international cooperation in a program for the conservation of yellowfin tuna. A resolution was adopted which urges that each of the countries which had been invited to participate in the San Jose meeting now make plans to send authorized representatives to a second inter-governmental meeting to be held immediately following the next meeting of the Inter-American Tropical Tuna Commission scheduled to be held in March 1963. Copies of this resolution will be distributed to the countries concerned in the hope that at the next meeting a representative from each country concerned will be in a position to report the progress which has been made by his country in the interim and also to indicate in behalf of the several countries a date as of which a joint yellowfin tuna conservation program can be simultaneously inaugurated. A second resolution adopted at the meeting requests that the parties to the Tuna Convention make arrangements to have the Tuna Commission provide each country with copies of Commission documents which are expected to be considered at the March meeting of the Commission.

EUROPEAN ECONOMIC COMMUNITY

PROPOSALS FOR CONFERENCE ON EUROPEAN COMMON MARKET FISHERIES POLICY:

Limiting participation in the first Conference on a European Common Market fisheries policy to countries within the European Economic Community (EEC) was recommended by the EEC Council of Ministers at its meeting during the week of November 12, 1962. The Council suggested that Denmark, Norway, and the United Kingdom might submit their views by memoranda. The time and place of the fisheries policy Conference remains unsettled, because the Council did not act on the recommendation of the EEC Commission that the Conference be held January 23, 1963, in Scheveningen, the Netherlands. The next meeting of the Council of Ministers at which the proposed Conference was to be discussed was re-

ported to be December 3, 1962, in Brussels, Belgium.

In a speech to the British Import Union on November 16, 1962, the Danish Prime Minister said that Denmark would submit its views on fisheries matters in a memorandum to the EEC Fisheries Conference. He pointed out that the Common Market countries were primarily consumers of fisheries products, while Denmark, Norway, and the United Kingdom were large producers. He believed it would be unfortunate if a fisheries policy was developed without regard to the interests of the latter countries. He hoped that Denmark would be able to bring its influence to bear on the matter. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 21, 1962.)

FISH MEAL

WORLD PRODUCTION, SEPTEMBER 1962:

World production of fish meal in September 1962 was 24.4 percent greater than in the same month of 1961, according to preliminary data from the International Association of Fish Meal Manufacturers. World production during the first nine months of 1962 was reported as 1,629,871 metric tons.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	September		Jan.-Sept.
	1962	1961	1962
.... (Metric Tons)			
Canada	6,123	5,007	58,736
Denmark	11,212	9,486	72,147
France	1,100	1,100	9,900
German Federal Republic ..	6,265	7,068	56,504
Netherlands	300	1,200	3,700
Spain	1,993	2,203	19,776
Sweden	327	694	3,086
United Kingdom	5,153	5,079	56,632
United States	28,270	26,124	215,041
Angola	1,230	1,359	19,895
Iceland	11,826	4,697	92,405
Norway	9,403	6,338	95,307
Peru	64,411	43,670	727,285
South Africa (including South-West Africa)	7,481	10,640	199,457
Total	155,094	124,665	1,629,871

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

There was a large increase in fish meal production this September in Peru (up 47.5 percent), Iceland (up 151.8 percent), and Norway (up 48.4 percent). This year through September, Peru had increased landings of anchoveta and Iceland and Norway had record landings of summer herring. Fish meal production also increased considerably this September in the United States (up 8.2 percent), Denmark (up 18.2 percent), and Canada (up 22.3 percent), but production dropped 29.7 percent in South Africa because it was the off-season.

International (Contd.):

Peru accounted for 41.5 percent of world fish meal production (for countries listed) in September 1962, followed by the United States with 18.2 percent.

During the first nine months of 1962, Peru accounted for 44.6 percent of total fish meal production, followed by the United States with 13.2 percent, and South Africa with 12.2 percent.

* * * * *

FISH MEAL EXPORTS AND PRODUCTION FOR SELECTED COUNTRIES, JANUARY-AUGUST 1962:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. During January-August 1962, total fish meal exports from the FEO countries were only slightly below their total production. Some FEO countries had a carry-over at the beginning of 1962 of stocks of fish meal produced the previous year.

oils (including whale and sperm whale oils, and fish and fish-liver oils). The 1963 estimated production is to be slightly less than in 1962 and 1961, but slightly more than in 1960.

Estimated World Production and Exports of Marine Oils ^{1/} , Average 1950-54, and 1955-59, Annual 1957-63								
2/1963	3/1962	1961	1960	1959	1958	1957	Average	
							1955-59	1950-54
..... (1,000 Short Tons)								
<u>Production:</u>								
1,270	1,311	1,309	1,141	1,131	1,059	1,033	1,074	990
<u>Exports:</u>								
840	871	839	785	722	701	677	687	639
1/Whale, sperm whale, fish, and fish-liver oils.								
2/Forecast.								
3/Partly forecast.								

Since 1950, there has been a steady increase in the world exports of marine oils (including whale and sperm whale oils, and fish and fish-liver oils). The 1963 exports are forecast as slightly less than in 1962, but about the same as in 1961. (Fats and Oils Situation, November 1962, FOS-215, Econom-

Production and Exports of Fish Meal by Member Countries of the Fish Meal Exporters' Organization, January-August 1962

Country	1962								
	January	February	March	April	May	June	July	August	Jan.-Aug.
..... (Metric Tons)									
Angola:									
Production	3,278	2,355	2,819	1,891	1,542	2,483	1,190	3,098	18,656
Exports	3,597	2,780	2,912	1,902	1,545	2,212	1,124	3,272	19,344
Iceland:									
Production	1,421	5,754	6,054	4,040	9,661	5,400	19,094	29,155	80,579
Exports	9,002	6,120	4,514	3,548	8,100	7,243	2,896	10,894	52,317
Norway:									
Production	4,081	3,738	4,959	3,345	3,822	10,739	36,494	18,726	85,904
Exports	10,047	4,946	3,103	2,010	1,512	1,595	3,342	4,187	30,742
Peru:									
Production	78,979	76,975	83,062	100,074	121,533	83,819	65,716	52,416	662,574
Exports	124,590	86,414	84,415	69,609	97,896	96,847	95,333	89,009	744,113
South Africa (incl. South-West Africa):									
Production	14,500	26,950	31,300	29,269	31,945	23,600	22,120	11,660	191,344
Exports	23,300	12,870	18,110	23,161	23,695	18,800	16,855	14,665	151,456
Total Production	170,536	113,130	113,054	100,230	132,748	126,697	119,550	122,027	1,039,057
Total Exports	102,259	115,772	128,194	138,619	168,503	126,041	144,614	115,055	997,972

In January-August 1962, Peru accounted for 74.6 percent of total fish meal exports by FEO countries, followed by South Africa with 15.2 percent, Iceland with 5.2 percent, Norway with 3.1 percent, and Angola with 1.9 percent.

MARINE OILS

ESTIMATED WORLD PRODUCTION AND EXPORTS OF MARINE OILS, 1957-63:

Since 1950, there has been a steady increase in the world production of marine

ic Research Service, U. S. Department of Agriculture.)

FOOD AND AGRICULTURE ORGANIZATION

DEVELOPMENT OF MECHANIZED FISHING FLEETS DISCUSSED AT IPFC TENTH SESSION:

The development of mechanized fishing fleets was one of the main topics discussed at the Tenth Session of the Indo-Pacific Fisheries Council (IPFC) held in Seoul, Korea, October 10-25, 1962.

International (Contd.):

The agenda for the 1962 symposium was centered on discussion of fishing vessels up to 10 gross tons. Among the problems to be dealt with were those on engine selection and maintenance, engine installation and propeller selection, mechanization of existing vessels, development of new mechanized vessels, and government programs for vessel mechanization. Experience papers from each of the 17 member countries of IPFC also were discussed at the Tenth Session.



In Thailand, separating the catch of a fishing boat according to kinds and size of fish. The woman in the center is a fish buyer.

Most fishing in the Far East is still done from small traditional sail or oar-propelled craft. During the past few years, the governments of Indo-Pacific countries carried out programs to equip those small fishing craft with outboard or inboard motors so as to expand their fishing range and at the same time increase the daily fish catches.

Note: See Commercial Fisheries Review, December 1962 p. 60.

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FIRST WORLD CONFERENCE ON PESTICIDES HELD IN ROME:

The first world conference on the use of pesticides in agriculture was held in Rome, November 12-17, 1962, under the sponsorship of the Food and Agriculture Organization (FAO). A wide range of recommendations was adopted by the 34 countries (among which was the United States) attending the meeting. FAO member Governments were urged to learn as much as possible about the safe and efficient use of pesticides as an aid to increasing world food production.

Among the recommendations made to member Governments at the meeting were:

1. Test and approve poisonous chemicals before they are given to farmers, and study the level of residues which may safely remain on crops.
2. Encourage basic research into plant and animal protection.
3. Study the possible side effects on crop fertility, fish and wild life, and on the beneficial insects when setting up permissible levels of residues.

As a result of the conference, FAO was asked to establish three working parties. One of the working parties was to deal with data on toxicity and methods of testing chemicals. It would seek to unify levels of amount of a specific chemical that a human being could safely absorb in a lifetime, and to help co-ordinate methods of analyzing compounds, etc. The second working party would concentrate on registration, approval, and labeling of pesticides. The third would deal with the growing problems of pests which develop resistance.

FAO was also requested to collect and disseminate more information on the vital problem of pesticides.

At the Eleventh Session of the FAO Conference held in Rome during October-November 1961, it was requested that a conference on pesticides be called during 1962. It was believed that such a meeting on the subject was needed because of an increasing volume and variety of pesticides being used during the production, processing, storage, and distribution of food and agricultural products in order to avoid serious losses in both quantity and quality of those products.

It was concluded at the Eleventh FAO Conference that the efficient and economical use of pesticides in agriculture was being hampered by the increasing apprehension as to the effects from the use of pesticides. It was then also concluded that misunderstanding of problems relating to pesticide residues in food, and that the lack of uniformity of approach by governments and industry might delay progress in pest control, and handicap international movement of agricultural products.

Note: See Commercial Fisheries Review, February 1962 p. 51.

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International (Contd.):

REGIONAL FISHERIES COMMISSION FOR WESTERN AFRICA

FIRST SESSION HELD IN TUNIS:

The First Session of the Regional Fisheries Commission for Western Africa was held in Tunis November 12-17, 1962. The Commission was set up to provide advice, technical assistance, and coordination to member countries on fisheries problems, and to conduct studies and research on the development of West African fisheries resources. However, the meeting ended on the first day and it did not proceed as planned.

An observer delegation from the United States was invited to attend the meeting.

The Director-General of the Food and Agriculture Organization was requested at the 10th Session of the FAO Conference held in November 1959, to explore the establishment of a Regional Fisheries Commission for Western Africa. The proposal was endorsed by the United Nations Economic Commission for Africa (UNECA) in February 1960, and by the first FAO Regional Conference for Africa at Lagos held in November 1960.

Note: See Commercial Fisheries Review, June 1961 p. 50.

GENERAL AGREEMENT ON TARIFFS AND TRADE

TWENTIETH SESSION ENDS:

The convening of a ministerial level meeting early in 1963, the prospect of the initiation of a major new movement of tariff and trade liberalization, trade problems arising from quotas and from the imposition of temporary customs surcharges, reports on developments in the European Economic Community (EEC) and other regional economic arrangements, and expansion of membership of GATT were among the principal subjects dealt with by the Contracting Parties to the GATT at their 20th session which took place in Geneva October 23-November 16, 1962. Over 80 countries, including the 44 GATT Contracting Parties, and 12 inter-governmental organizations were represented at the Session.

The decision of the Contracting Parties to call for a GATT Ministerial Meeting the early part of next year stemmed from a joint proposal of the United States and Canada. Widely endorsed during the session by contracting parties at all levels of economic development, the initiative grew out of the

sponsors' conviction that there is now a pressing need for ministers to consider basic trade problems and policies if satisfactory and mutually beneficial international trading relations are to be furthered.

The United States Representative pointed out that the recently enacted Trade Expansion Act, with its unprecedented and far-reaching authority in the trade field, would enable the United States to participate fully in the kind of broad and comprehensive program of world trade liberalization for which it is anticipated that the forthcoming Ministerial Meeting would provide stimulus and direction.

The holding of a new conference for the comprehensive reduction of tariff barriers on industrial goods and primary products, possibly in 1964, would be a prime consideration of ministers, but with full recognition that if the legitimate trade interests of all Contracting Parties are to be met, significant progress must be made at the same time in such other vital trade areas as agricultural protectionism and the need of the less developed countries for expanding markets.

In addition to their annual consideration of reports of consultations by the Committee on Balance-of-Payments restrictions with 13 countries maintaining quantitative import restrictions in accordance with GATT provisions, the Contracting Parties had before them several issues dealing with other types of import restrictions. Prominent among those was the United States complaint against France and Italy for their persistent use of import prohibitions and quotas which impaired or nullified tariff concessions which the EEC had given to the United States. Through bilateral consultations conducted during the session with Italian representatives, the United States Delegation was successful in securing a commitment to liberalize a significant group of products of interest to the United States. On the basis of this forthcoming action by the Italian Government, and with the understanding that bilateral consultations would be continued on remaining import restrictions, the United States withdrew its complaint against Italy from this session's agenda.

In the case of the French import restrictions, the Contracting Parties convened a panel which examined the facts of the complaint in accordance with prescribed GATT (Article XXIII) procedures, presented a re-

International (Contd.):

port which sustained the United States argument of nullification or impairment of trade benefits due the United States, and called upon the French Government to withdraw its trade restrictions which were inconsistent with the GATT. At the same time the panel recommended that the United States refrain "for a reasonable period" from exercising its right under Article XXIII to suspend the application to France of concessions and other trade obligations equivalent to those being denied to United States exports. It is hoped that the findings and recommendations of the Contracting Parties will lead to early and satisfactory progress in the removal of French restrictions which have adversely affected United States exports to France.^{1/}

In another area of trade restrictions of particular significance to United States export interests, the Contracting Parties considered the temporary import surcharges which were imposed by Canada in June 1962 for balance-of-payments reasons. The Contracting Parties expressed regret that the Canadian Government had found it necessary to introduce temporary measures contrary to the GATT, recommended that Canada remove its surcharges expeditiously, and requested Canada to report in the early part of 1963 on action taken to this end. The Canadian Delegation in undertaking to cooperate to the fullest possible extent in following the decision of the Contracting Parties, cited as evidence of its intentions a further liberalization step. By this new action, surcharges were being relaxed on products having an annual import value of about \$260 million.^{2/}

As further evidence of increasing concern of Contracting Parties over import restrictions still imposed by some countries inconsistent with GATT provisions, arrangements were made for a continuation of notification and examination procedures designed to maintain maximum pressure for the removal of such restrictions.

In the field of regional economic integration, the Contracting Parties heard reports and conducted examinations of developments in Europe, Latin America, and Africa. They gave special attention to a report by a standing GATT committee on the EEC's Common

^{1/}Fish oil is among the United States products that have been adversely affected by French import restrictions.

^{2/}The Canadian surcharges applied to all fishery products and were recently removed by the Canadian Government.

Agricultural Policy and to a Working Party examination of the agreement providing for the association of Greece with the EEC. While Contracting Parties voiced their appreciation of the EEC's accomplishments in laying the groundwork for the highly complex operations required to carry out a common agricultural policy, various countries, including the United States, recorded their concern over certain protectionist aspects of the policy and their apprehensions that the policy could in some areas lead to an uneconomic degree of self-sufficiency in agricultural trade which could work to the detriment of traditional, efficient agricultural exporting nations. With regard to an examination earlier this year of the EEC-Greek association agreement, the Contracting Parties decided that in view of divergent views on the implications of the agreement with respect to trade interests of individual countries and with regard to certain provisions of the GATT, the application of the agreement would be kept under review, with Contracting Parties free to exercise their rights under the GATT should any of them consider their national interests adversely affected by implementation of the agreement.

Members of the European Free Trade Association, the Latin American Free Trade Area, and the Central American Free Trade Area also reported on progress in completing their regional trading arrangements.

Two recent agreements for regional groupings in Africa, the African Common Market and the Ghana-Upper Volta Trade Agreement, were referred to a Working Group which will study the agreements to see whether they qualify as customs unions or free trade areas under Article XXIV of the GATT. A report is to be made to the GATT Council of Representatives early in 1963.

The number of full Contracting Parties to the GATT rose from 42 to 44 with the accession of two newly-independent states: Trinidad and Tobago, and Uganda. In addition, the Contracting Parties approved the provisional accession to the GATT of Yugoslavia and the United Arab Republic, and extended for two more years a decision granting provisional accession to Argentina. The Contracting Parties also agreed to continue for another year special arrangements to afford 15 newly independent states of Africa a further opportunity to examine their future commercial policies and decide whether they should seek accession to the GATT in their own right.

International (Contd.):

As has been the rule for several years, the Contracting Parties devoted an important portion of their time to the progress for the expansion of international trade, the key elements of which are tariff reduction, improved access to markets for agricultural products, and the removal of obstacles to the trade of less developed countries. While to a considerable extent further progress in these areas will be dependent on policy guidance emerging from the forthcoming Ministerial Meeting, the Contracting Parties are endeavoring to maintain the momentum already established since the last Ministerial Meeting with a view to providing the basis for possible further action to be initiated at the 1963 gathering of ministers. It is expected that a Working Group on Tariff Reduction will begin to meet in the near future in order to lay the groundwork for an imaginative and comprehensive program for tariff reduction and trade liberalization.

Meeting at frequent intervals throughout the session, Committee III, which is concerned with expansion of the export earnings of less developed countries, took stock of the progress that has been made in the reduction of the tariff and non-tariff barriers impeding such expansion. The Committee considered proposals by a group of these countries within GATT for more rapid and concrete action to this end. It was agreed to give further attention to other possibilities for enhancing the Committee's usefulness in helping the less developed countries enlarge their export earning capacity, including greater stress on consultations with industrial countries maintaining restrictions harmful to the trade of developing countries and consultations with developing countries designed to clarify the relationship between their trade prospects and the financing of their economic development.

The committee meetings revealed that the less developed countries are far from satisfied with progress made to date towards the objectives of the Declaration on the Promotion of the Trade of the Less Developed Countries adopted last year and desire an intensified effort to remove the trade barriers which now encumber their export trade. They did, however, welcome the United States Trade Expansion Act as a promising means of achieving some of their trade objectives.

A wide variety of other trade policy matters also came before the Contracting Parties. In a review of the status of Article XXXV, under which many Contracting Parties withhold the application of the GATT to Japan, the Contracting Parties welcomed the agreement of the United Kingdom to disinvoke this article as well as steps by others toward the same end. They expressed the hope that other countries now invoking this article would reconsider and fully apply the provisions of the GATT in their trade with Japan. Following exchanges of views with other delegations and a reappraisal of the present stage of bilateral negotiations, the United States Delegation announced that it had been decided not to ask the Contracting Parties at this session to vote for a waiver which would permit the entry into effect on January 1, 1963, of the revised United States tariff schedules authorized in the Tariff Classification Act of 1962. The United States Delegation reviewed the importance the United States still attached to early implementation of the revised schedules, but explained that consultations under way since September had in some cases proved more time-consuming than anticipated and had also been affected by the problem of providing adequate documentation. The United States Delegation, however, underscored its intention not to slacken efforts in providing documentation and other technical assistance to other delegations in order that consultations and negotiations can move forward to completion as rapidly as possible.

It was agreed that the 21st Session of the Contracting Parties will take place from October 22 to November 15, 1963.

Note: See Commercial Fisheries Review, December 1962 p. 56.

INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

REPORT ON FIFTIETH STATUTORY MEETING:

The International Council for the Exploration of the Sea (ICES) held its 50th Statutory Meeting in Copenhagen, Denmark, October 1-10, 1962. It was attended by 175 delegates, experts, and observers representing 18 countries and 14 scientific organizations. A Special Meeting "to consider problems in the exploitation and regulation of the fisheries for Crustacea" immediately preceded the Statutory Meeting and lasted three days.

At the Special Meeting on Crustacea, two representatives of the Bureau of Commercial

International (Contd.):

Fisheries gave technical papers on the dynamics of king crab and penaeid shrimp populations, and one representative of the Fisheries Research Board of Canada presented a summary of lobster research. In addition, 8 scientists from the United States and 2 from Canada attended both meetings as nonofficial observers or informal participants.

The International Council, the oldest and perhaps the foremost organization of its kind, has a membership comprising 16 northern European countries. Its primary function has been and continues to be the coordination of efforts by member governments to ensure, by means of research and regulatory measures, the rational exploitation of marine (fishery) resources commonly fished by the nationals of each. Geographically, the Council's area of responsibility may be roughly defined as the North Atlantic Ocean from Greenland eastward to and including the Norwegian, North, Barents, and Baltic Seas, as well as all contiguous or adjacent European waters. Largely because of the Council's geographical area of interest, neither the United States nor Canada have as yet deemed membership necessary.

The Council operates through a system of 18 Committees, 14 of which are technical in scope and 4 administrative. The technical committees are composed of varying numbers of experts and established according to (1) type of general activity (e.g., the Hydrographical and Statistical Committees); (2) diverse research on particular groups of fishes (e.g., the Sardine and Herring Committees); or (3) exploited fish resources in a particular area (e.g., the Atlantic and Baltic-Belt Seas Committees).

Proceedings during the five-day period set aside for Committee meetings proved quite extensive (about 195 technical reports were presented) and the results therefore difficult to rank according to their relative importance. On the basis of amount of attention received, the following items, in the form of Committee recommendations to the Council, could be classed as the more significant:

(1) Increase efforts to align activities of oceanographers and fishery scientists;

(2) Focus more attention on the fast-growing problem of marine radioactivity;

(3) Re-evaluate the ultimate benefits of synoptic surveys of the marine environment and its inhabitants;

(4) Strengthen proposals to standardize methods of plankton research in particular and marine research in general;

(5) Expedite analysis and presentation of results of the International (multi-ship) Experiment on cod end mesh selectivity conducted in 1962;

(6) Hold Symposium of "Measurement of Abundance of Fish Stocks" immediately prior to 1963 Council Meeting which is to be held in Madrid;

(7) Undertake an International Herring Research Scheme which would involve selection of an area (such as a Norwegian fjord) harboring an isolated, unexploited herring population on which could be conducted an intensive dynamics study;

(8) Endorse the world meeting on Crustacea proposed by FAO;

(9) Enhance coordination in the execution of mark-recapture experiments being conducted on a variety of species by ICES members.

Some 43 scientific papers presented during the Special Meeting on Crustacea drew attention to: Lobster conservation and the need to control newly-discovered lobster diseases; attempts by the U. S. S. R. to transplant the Kamchatka king crab in the Barents Sea; the slow progress of research prerequisite to rational exploitation of prawn and shrimp; new theories in managing crab fisheries; and recent problems arising in connection with expanding fisheries for the Norway lobster. The Meeting closed with the general conclusion that the steadily increasing world demand for edible Crustacea of all kinds necessitates ensurance of expanding production based upon the modern principles of resource management.

Note: See Commercial Fisheries Review, October 1962 p. 45.

--Joseph H. Kutkahn,
Assistant Laboratory Director,
U. S. Bureau of Commercial Fisheries,
Biological Laboratory, Galveston, Tex.

GREAT LAKES FISHERY COMMISSION

MEETS IN OTTAWA:

An important contribution to science is being made in the development of a specific

International (Contd.):

poison to eradicate sea lampreys, Canadian Fisheries Minister J. Angus MacLean said at a meeting of the Great Lakes Fishery Commission held on November 27, 1962, in Ottawa. The sea lamprey is the predator responsible for the decimation of commercially valuable fish stocks in the Great Lakes. He stated that Canada and the United States have a great opportunity to show the world what can be done in the field of international conservation and development of a living resource. Canada and the United States are signatories to the bilateral convention under which the Great Lakes Fishery Commission operates.

The Canadian Fisheries Minister stated it was a very important time for the Commission because it was entering the eighth year of its treaty. It was considered a year when the Commission would have to assess its position and to review its accomplishments. He said that the Commission had provided excellent results for the expenditures invested in it, and he was confident that the good results would continue in the future. The Canadian federal Deputy Minister of Fisheries also referred to the Commission's achievements, particularly with respect to its measures to check the sea lamprey.

Speaking for the United States representation, D. L. McKernan, Director of the Bureau of Commercial Fisheries, said that his government regards the Commission as another example of the close relationship between the two countries. He said Canada's active participation in international fishery commissions was exemplified by the fact that its Deputy Minister of Fisheries had served as chairman on more international fisheries commissions than any man alive.

Note: See Commercial Fisheries Review, September 1962 p. 54.

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CANADA-UNITED STATES SEA LAMPREY CONTROL MEASURES IN GREAT LAKES PRODUCING RESULTS:

A concerted effort by Canada and the United States to control the sea lamprey of the Great Lakes is producing very encouraging results. On November 28, 1962 at the final session of the meeting of the Great Lakes Fishery Commission, held in Ottawa, the Commission Chairman said that real progress has been made in checking the spread of sea lamprey populations through the use of a specific poison or lampricide. However, he stressed that there still remains much to be done and the lamprey problem must be kept under constant observation.

Surveys of known lamprey-producing streams in both Canadian and United States waters of Lake Superior in 1962 showed that the adult population had been reduced by about 80 percent since the introduction of the lampricide. This information was contained in reports presented by scientists of the Fisheries Research Board of Canada and the U. S. Bureau of Commercial Fisheries, the agencies which conduct the Commission's scientific programs.

Both scientific agencies in their reports emphasized the importance of resurveying streams which had already been chemically treated. This year scientists resurveyed 178 streams on the Canadian side of Lake Superior and found that only 8 were again producing sea lamprey. To date 5 of those streams have been retreated. An additional 503 streams entering Lake Superior from the United States were resurveyed and only 6 of those were again producing lamprey, but in much smaller numbers.

United States officials reported that 20 known lamprey-producing streams in Lake Superior had now received their second treatment with lampricide. Additional streams will be retreated next spring.

Initial treatment of streams in Lake Michigan is now under way and a survey of Lake Huron to determine lamprey-producing streams is nearing completion.

The meeting also heard a report on a lake trout rehabilitation program for Lake Superior. In 1962, some 1,800,000 yearling lake trout were planted in the lake, an increase of about 600,000 over the previous year.

At an earlier session the Commission heard reports from the U. S. Bureau of Commercial Fisheries, the Ontario Department of Lands and Forests, and the Ohio Division of Wildlife, concerning the decline in recent years of the yellow pike (walleye) population of Lake Erie. Following a discussion of the three reports, the Commission decided that more scientific data would have to be documented before the Commission can recommend any course of action. It also suggested that the three agencies prepare a single report on the yellow pike problem and present this to their respective governments before the end of January 1963. Such a report would also be referred by the Commission to its scientific agencies and considered again at its next meeting.

NORTH PACIFIC FUR SEAL COMMISSION

REPORT ON SIXTH ANNUAL MEETING:

The North Pacific Fur Seal Commission concluded its Sixth Annual Meeting at Washington, D. C., on November 26, 1962, after adopting a recommendation to the four contracting countries concerning the method of sealing best suited to achieve the objectives of the Interim Convention on Conservation of North Pacific Fur Seals. For all fur seal islands, the Commission gave approval to a 1963 fur seal harvest which would be somewhat higher than the 1962 harvest. That decision indicates the continued success of the Commission in developing stocks of fur seals in the North Pacific to levels designed to produce the highest sustainable yields.

The Commission is composed of representatives from the member countries of Canada, Japan, the U.S.S.R., and the United States. The Commissioners are George R. Clark, Deputy Minister of Fisheries of Cana-

International (Contd.):

da; Shunichi Ohkuchi, Director, Marine Production Division, Fisheries Agency, Ministry of Agriculture and Forestry of Japan; A. S. Babaev, Deputy Chief, Far Eastern Fisheries Division, State Committee on Fisheries, Council of Ministers, of the U.S.S.R.; and Ralph C. Baker, Chief of the Division of Resource Development, U. S. Bureau of Commercial Fisheries. W. M. Sprules, Special Assistant to the Deputy Minister of Fisheries, acted for the Commissioner of Canada who was unable to attend the Sixth Commission Meeting. The Commission Meeting was preceded by a meeting of the Commission's Standing Scientific Committee. That Committee met November 20-23.

The North Pacific Fur Seal Commission has as its major responsibility the investigation of the fur seal resources of the North Pacific Ocean. The objective of the investigation is to determine the measures which will make possible the maximum sustainable yield from those resources, with due regard for their relationship to the productivity of other living marine resources in the area. The Convention requires that the Commission recommend to the four Governments at the end of the fifth convention year (October 13, 1962) the methods of sealing best suited to achieve that objective.

To aid it in determining the best methods of sealing, the Commission reviewed two reports prepared by its Standing Scientific Committee. One report gave the results of research conducted from 1958 through 1961 by scientists of the four countries, and the other reported on research conducted during the 1962 season.

The Commission took into account the current scientific knowledge of fur seals and the present technology of land and pelagic sealing. The Commission recommended to its Member Governments that land sealing, when carried out under strict government control and in accordance with appropriate measures regarding the size, sex, and age composition of the seasonal kill from a herd, is the method best suited to achieve the objectives of the Convention. The Commission also recommended that research be continued on the methods of sealing, as well as on other measures necessary to achieve the objectives of the Convention.

Under the terms of the Convention, pelagic sealing (killing of seals at sea) is forbidden except for specific numbers that may be taken pelagically for research purposes by scientists of the Member Countries, and for the operations of aborigines using primitive weapons. All land harvesting is done on the breeding grounds under the control of the Soviet Government on Robben Island in the Sea of Okhotsk and the Commander Islands in the western Bering Sea, and under the control of the United States on the Pribilof Islands in the eastern Bering Sea. During 1962, the commercial land take of seals by the U.S.S.R. was 12,427 and by the United States, 77,929. The Convention contains a provision whereby Canada and Japan each receive 15 percent of the seal skins taken in commercial operations on the breeding grounds under United States control. Subject to certain stipulations, Canada and Japan are entitled to a like percentage of the commercial take on the breeding grounds under U.S.S.R. control.

In accordance with plans developed by the Commission, research agencies of the four participating countries carry out research at sea. Research and management on the breeding grounds are conducted by the United States on the Pribilof Islands and by the Soviet Union on the Commander Islands and on Robben Island. The scientific investigations are concerned with the dynamics of the fur seal populations, distribution and migration at sea, feeding habits, and harvesting methods.

During 1962, scientists of the four Member Countries conducted extensive research at sea and the results of those operations, together with those of the U.S.S.R. and the United States on the breeding grounds under their respective control, were reviewed by the Commission.

Recoveries of tags from seals taken in research collections at sea and in harvests on the breeding grounds indicate that the seal herds of the eastern and western regions of the North Pacific Ocean intermingle to some extent both at sea and on the breeding islands.

Research at sea in 1963 will begin in January. It will be planned to obtain additional information on intermingling, distribution, abundance, and food habits of the herds. On land, the scientists will concentrate on studies of sizes, changes, and trends in fur seal populations.

International (Contd.):

Invitations have been extended by the U.S.S.R. to the scientists of Canada, Japan, and the United States to visit the Robben Island seal rookery during fur seal harvesting operations in 1963. A high degree of cooperation in the conduct of the Commission's scientific work exists among the Member Countries.

The Canadian Commissioner, George R. Clark, was elected Chairman of the Commission, and Shunichi Ohkuchi, the Japanese Commissioner, was elected Vice Chairman. The newly elected officers will serve through the next annual meeting.

The next annual meeting of the Commission will be held in Moscow, U.S.S.R., at a time not yet determined, but possibly in February 1964. The Standing Scientific Committee will meet one week prior to that meeting to consider the results of the preceding year's investigations and to prepare its report to the Commission.

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STATEMENT BY SECRETARY OF THE INTERIOR AT THE SIXTH ANNUAL MEETING OF COMMISSION:

At the Sixth Annual Meeting of the North Pacific Fur Seal Commission, Washington, D. C., during the November 26, 1962, opening plenary session, United States Secretary of the Interior Stewart L. Udall said:

"It is with great pleasure that I welcome you to the city of Washington for the sixth annual meeting of the North Pacific Fur Seal Commission. The work of this Commission has been outstanding in demonstrating the results that can be obtained through international cooperation in managing a natural resource of international interest. All of you who are associated with this organization can be proud of the record you have made. At this time, when we are only beginning to recognize the importance of our marine resources in enhancing the standards of living of peoples throughout the world, it is most encouraging to have the accomplishments of this Commission as an example for other international endeavors.

"Last year marked the 50th anniversary of the signing of the original four-party treaty among Canada, Japan, Russia, and

the United States for the conservation of North Pacific fur seals. During this period the fur-seal resource in the North Pacific has increased from less than a quarter of a million to over one and three-quarter million animals. During the term of the present Convention, all the fur-seal stocks in this area have flourished.

"In 1958 an extensive cooperative research program was initiated under your auspices, involving investigations both on the high seas and on the rookery areas. Research vessels of the four Party Governments have ranged over a broad area of the North Pacific in a carefully coordinated study of the habits of fur seals in their marine environment. Other comprehensive studies recommended by the Commission have been carried out to good effect by the Soviet Union and the United States on the various fur-seal rookery areas under their respective control. The mutual research objectives of the parties have been advanced to a high degree through frequent exchanges of scientific personnel and through a free flow of data and ideas among their research teams.

"Significant results from this research have included information concerning migration routes, intermingling of North American and Asian stocks, food habits, life history, and population dynamics of fur seals. We have learned, for example, that significant numbers of fur seals born on the Pribilof Islands appear some years later on the Kommandorski Islands off Kamchatka, and, conversely, that fur seals born on the fur seal islands off the Asian coast later are found in significant numbers on the Pribilof Islands.

Research programs approved by the Commission have accelerated the adoption of new management techniques. For instance, female fur seals of the North American herd now are being harvested selectively on a large scale. It is gratifying to note that high-quality female fur seal pelts are increasingly in demand in the fur markets of the world. Through utilization of both sexes of fur seals, greater benefits can be realized from this resource as all of the North Pacific herds approach maximum levels of development.

"The Interim Convention on Conservation of North Pacific Fur Seals entered into force on October 14, 1957, more than five years ago. It is now appropriate under the terms of the Convention that the governments reach early agreement as to the nature of future

International (Contd.):

arrangements for international cooperation in the conservation of the North Pacific fur seal. During the past five years of intensive research, the Commission has accumulated a wealth of information upon which to base wise recommendations in this matter. I am most hopeful that the deliberations of this meeting will point the way to a permanent convention that will assure the conservation and rational utilization of this valuable resource for the benefit of all concerned.

"Again let me welcome you to Washington. I hope that you will enjoy your visit and that your meeting here will be most fruitful."

UNESCO

MARINE TAXONOMIC EXPERT
APPOINTED FOR SOUTHEAST ASIA AREA:

The former Director, Dr. Raoul Serene, and later Adviser of the Oceanographic Institute of Nhatrang, Vietnam, has been appointed by UNESCO as Marine Taxonomic Expert to be attached to the UNESCO Southeast Asia Science Cooperation Office. The marine biologist has been working in the Southeast Asia region for many years and has acquired wide experience in marine science matters of the region. He was scheduled to assume his new duties in May 1962.

The assignment of a Marine Taxonomic Expert for the Southeast Asia region is the result of a recommendation adopted by the Regional Meeting on Marine Sciences convened by the Southeast Asia Science Cooperation Office in Saigon in January 1959.

The duties of the expert include the following:

1. To visit the countries of the region to determine the actual status of existing reference collections, their administration, facilities and equipment, staff, and associated library and laboratories.

2. To assist the scientists and governmental authorities in each country to establish or strengthen national reference collections, demonstrating how they should be organized and maintained, and assisting in training those persons who will carry out the work.

3. To assist local taxonomists in the identification of marine organisms.

4. To advise UNESCO on plans and needs of marine scientists in the region.

The marine biologist is initially assigned for the above work by the UNESCO Office of Oceanography for a period of one year. It is planned that he should visit initially for periods of approximately one month each of the countries of the region which are concerned with marine sciences and request his services. (Pacific Science Association Information Bulletin, July 1962.)

WORLD FISHERY CATCH

LANDINGS, 1961:

The world fish catch for 1961 was 41.2 million metric tons, an increase of 8 percent over 1960.

Japan continued to lead the world's fishing nations. Japan's share of the 1961 catch was 6.7 million tons, 0.5 million tons more than her 1960 catch. Japan has been the leading fishing nation since 1948. In 1960 she became the first country to reap more than six million tons of fish from the earth's waters.



Fig. 1 - A large Soviet fishery factoryship.

Peru, with a catch of 5.2 million tons in 1961, is the number two fishing nation. Mainland China occupies the third spot, although computation of its catch (5 million tons) was based on estimates made by FAO. The Union of Soviet Socialist Republics and the United States, with catches of 3.2 and 2.9 million tons, respectively, are listed as four and five among the fishing powers. Other countries whose 1961 catch was 500,000 or more tons were: Norway, 1,500,000; Canada, 1,020,800; Spain, 1,014,500; South Africa and South-



Fig. 2 - British distant-water trawler Churchill approaching dock at Grimsby--fishes off Iceland, Greenland, and other distant grounds.

International (Contd.):



Fig. 3 - In Tunisia a vessel fishing at night is equipped with electric surface lamps for attracting fish. Here a net-load of fish is being hauled aboard.



Fig. 4 - In Somaliland a local fisherman is weighing fish.



Fig. 5 - A fishing vessel at Hout's Bay, South Africa Republic, with a catch of spiny lobsters.



Fig. 6 - A Panamanian shrimp trawler.



Fig. 7 - In Mexico, Patzouaro Lake fishermen operating their unusual fishing gear.

West Africa, 1,010,300; India, 961,000; United Kingdom, 897,000; Denmark and Faroe Islands, 758,000; Indonesia, 734,000; Iceland, 703,000; German Federal Republic, 619,000; France, 568,000.

FAO experts also estimated the value of international trade in fish and fish products at between \$1,300 million and \$1,400 million, an increase of about \$50 million over 1960.

International (Contd.):

Chief species taken during the 1961 fisheries harvest were the herring, sardine, and anchovy-type fish. These made up 12.6 million tons or almost one-third of the world catch, a rise of 2.3 million tons over 1960. The cods, hakes, and haddocks came in second place with 5.1 million tons reported. This represented an increase of 300,000 tons over the 4.8 million tons caught during 1960. Fresh-water fish accounted for 4.4 million tons of the world total, about the same quantity as caught in 1960.

Four million tons of mullets, jacks, and sea basses were taken in 1961, 200,000 above the 1960 catch. The 1961 total for mollusk and crustaceans was 3.2 million tons. Crustaceans include lobsters, shrimp, and crabs while mollusk include oysters, mussels, clams, and squid. The catch of tuna, bonitos, and mackerel rose from two million tons in 1960 to 2.1 million in 1961. Flounder, sole, halibut, and other flat-fish caught rose from 1.2 million tons in 1960 to 1.3 million in 1961. The salmon, smelts, and trouts were up from 600,000 to 800,000 tons.

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ONE-QUARTER OF CATCH USED IN FISH MEAL AND OIL PRODUCTION:

Almost one out of every four tons of fish caught during 1961 was used for reduction to fish meal and oil, according to the Food and Agriculture Organization. Of a total 1961 world catch of 41.2 million metric tons, 9.6 million tons (or 23 percent) was used to make meal and oil for feeding animals. (The total of 9.6 million tons refers to the weight of live fish as they are taken from the water, not to the weight of finished oils and meals.)



Fig. 1 - In Peru, anchoveta boat waiting to unload at the Port of Chimbote.

The 31.6 million metric tons remaining was used for human food in fresh, frozen, cured, or canned form. From canneries, freezing and filleting plants, smokeries and salting yards, one million tons of offal--raw material or waste from fish used primarily for other purposes--was also used for making meal and oil.

More fish, therefore, were reduced to oil and meal than in any previous year, the quantities of whole fish used rising by 2.1 million tons above the 1960 total of 7.5 million metric tons. World fish meal and oil production has doubled since 1956. Peru has accounted for the bulk of this increase.



Fig. 2 - In the United States, a large menhaden fishing vessel at the Reedville, Virginia, dock of an industrial fish plant.

For the third straight year Peru led all other nations, with 5,012,100 tons--or better than 90 percent--of her total catch of 5,213,100 tons used to make meal. Peru's meal production, made from anchoveta, has multiplied by some 30 times since 1956.

Number-two fish meal producer was the United States with 1,067,800 tons of the 1961 fishery catch of 2,874,400 tons used for meal and oil. United States production has remained approximately steady for the past half dozen years.

Other nations during 1961 which used 100,000 or more tons of fish to make meal and oil were (in metric tons): Japan 843,300; Norway 754,800; South Africa and South-West Africa 467,600; Chile 337,600; Denmark 316,100; Iceland 229,900; and Canada 187,200.

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TUNA, BONITO, AND MACKEREL CATCH WAS UP IN 1961:

The world catch of tuna, bonito, and mackerel was 2.1 million metric tons in 1961, an

International (Contd.):

increase of 50,000 tons over the 1960 catch, according to the "Yearbook of Fisheries Statistics" issued in November 1962 by the Food and Agriculture Organization. World fishing of this group of fish has shown a tendency to rise steadily each year since 1956, when 1.7 million tons were landed.



Fig. 1 - During the last two years in the United States, a large number of California tuna bait boats (pole-and-line fishing) have been converted to purse seiners. This is a typical California converted tuna purse seiner.

Japan, with 1,036,700 tons, accounted for just under one-half the 1961 world catch of tuna, bonito, and mackerel. In 1960 Japanese fishermen landed 930,400 tons.

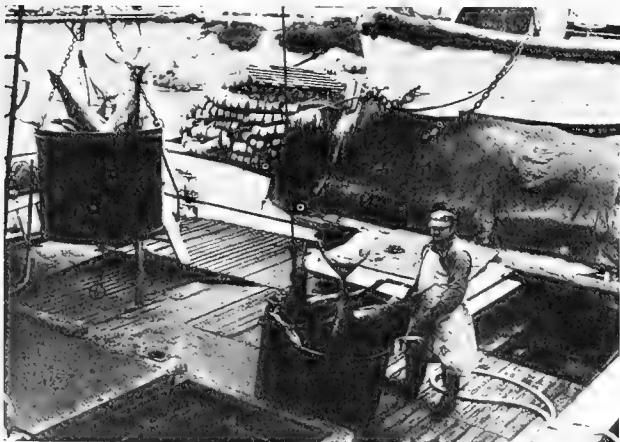


Fig. 2 - Unloading frozen tuna from a California tuna purse seiner.

In second place came the United States with 175,000 tons, an increase of 15,200 tons over the 1960 catch but still under the 1956 high of 186,100 tons.

Peru was the number-three nation in fishing this group of fish in 1961 with a catch of 146,500 tons. Peru's 1960 total was 134,400

tons. The great bulk of the Peruvian catch was bonito.

India's catch of this group of fish dropped sharply--from 165,400 tons in 1960 to 73,300 tons in 1961. The Indian catch is made up mainly of mackerel and it was the drop from 133,700 tons of mackerel caught in 1960 to only 34,500 tons in 1961 that accounted for India's reduced 1961 catch.



Fig. 3 - In Libya, Mediterranean fishermen use set nets to catch tuna.

South Africa's 1961 catch of 61,800 tons was about 50 percent above the 1960 total of 38,200 tons. Practically all the South African catch was mackerel. The French catch of tuna, bonito, and mackerel dipped to 60,100 tons from 68,300 in 1960. China (Taiwan) took 51,700 tons in 1961--up from 44,300 tons in 1960. Spain's catch also dropped--from 56,400 tons in 1960 to 42,900 in 1961. No other nation took as much as 40,000 tons of this group of fish in 1961.

TRADE

JOINT UNITED STATES-JAPAN TRADE AND ECONOMIC COMMITTEE MEETING:

The White House in November 1962 announced plans for the second meeting of the Joint United States-Japan Committee on Trade and Economic Affairs, December 3-5, 1962, in Washington, D. C.

The White House announcement said that "the second meeting will afford a welcome opportunity to continue and build on the achievements of the first," which was held in Japan in November 1961.

The six Japanese Cabinet officers designated by Prime Minister Ikeda to attend the meeting, all of whom were appointed in July 1962 included the Minister of International

International (Contd.):

Trade and Industry, and the Minister of Agriculture and Forestry. The United States delegation consisted of the Secretary of State as Chairman of the meeting, Secretary of the Treasury, Secretary of the Interior, Secretary of Agriculture, Secretary of Labor, Acting Secretary of Commerce, and Chairman of Economic Advisers.

In the course of the daily sessions, the White House said, the Joint Committee would consider the two countries' current economic situations, financial, monetary, and balance of payments situations, economic growth, expansion of trade, and promotion of economic relations, trends in international trade and economic relations, and problems of economic development in the less developed countries.



Austria

AUSTRIA LIBERALIZES IMPORT REGULATIONS OF SOME FISHERY PRODUCTS:

Smoked and preserved fish may now enter Austria without a certificate of origin. The change in import regulations became effective when announced by the Austrian Ministry of Interior, November 1, 1962. Editor's note: Withdrawal of certificates of origin may improve the market in Austria for United States smoked and preserved fishery products. At present, very little fish is exported to Austria directly from the United States. It is believed that Austria has received some United States fishery products by transshipment from Germany and other countries.

Canned sardines in olive oil may enter Austria duty free between November 1, 1962, and January 31, 1963. The Austrian import duty on canned sardines in olive oil has been 6 percent ad valorem. The Austrian retail price of canned sardines in olive oil should be reduced by the tariff cut, which was effected by Ordinance No. 103,000-13/62 of the Austrian Finance Ministry.

Canned sardines in olive oil is the only fishery product included in the widespread Austrian tariff cuts of November 1, 1962. The import duty on some products was reduced for an indefinite period. Tariff reduc-

tion is part of the Austrian Government's price stabilization program. The Government wishes to give the consumer the benefit of tariff cuts. Importers who do not pass on the entire advantage of reduced customs duties will be compelled to pay the full import duties previously in effect. (United States Embassy, Vienna, November 9, 1962.)



Brazil

NORTHEAST BRAZIL'S WHALE CATCH, 1960-62:

A Japanese firm with two whale catcher vessels caught and processed in their Paraiba plant, 511 whales in 1960 and 521 whales in 1961.

Landings of Whales by Months in Northeast Brazil			
Month	1962	1961	1960
June	17	8	33
July	72	135	103
August	-	204	168
September	-	172	164
October	-	2	43
Total	89	521	511

The 1961 landings consisted of 501 sei whales, 8 humpback whales, and 5 sperm whales.

In the 1962 season the Japanese operated only one catcher vessel which landed 89 whales (mostly sei) as of July 15. The whaling grounds are located only 40-100 miles offshore from Paraiba. (United States Consulate, Recife, July 31, 1965.)

Editor's Note: Sei whales have low oil yield.



Canada

BRITISH COLUMBIA CANNED SALMON PACK REACHES HIGH LEVEL IN 1962:

The 1962 pack of canned salmon by the British Columbia canneries of close to 1.8 million standard cases (48-1-lb. cans) was up about 28.7 percent from the 1.4 million cases packed in 1961 and almost threefold the 1960 pack. In addition, the pack in 1962 exceeded the average pack for 1957-1961 by about 40.0 percent.

The pack of pink salmon in 1962 of close to 1.2 million cases was one of the best in

Canada (Contd.):

Pack of British Columbia Canned Salmon, 1957-1962						
Species	1962	1/1961	1/1960	1/1959	1/1958	1/1957
(Standard Cases--48-1-Lb. Cans)						
Sockeye (red)	298,188	398,236	226,905	256,170	1,074,305	228,452
Spring (king)	7,069	7,927	5,913	15,230	10,550	10,481
Steelhead	818	979	500	867	1,205	1,126
Blueback	12,050	12,527	23,456	10,114	11,103	12,147
Coho (silver)	175,913	234,047	68,891	202,991	120,424	180,911
Pink	1,187,933	661,458	219,624	458,597	451,802	751,608
Chum (keta)	133,638	95,400	86,800	133,128	230,636	239,539
Total	1,815,609	2,141,574	2,632,089	2,107,097	1,900,025	1,424,264

1/Totals are based on final revised figures.
2/Includes fish canned from previous year's frozen stock.

many years and made up about 65.4 percent of the total salmon pack for the year. The pack of sockeye or red salmon in 1962 was fair, but disappointing from the standpoint of the vast numbers of spawners in 1958, the parent of the 1962 sockeye salmon stocks.

Note: See Commercial Fisheries Review, Nov. 1962 pp. 61-62, February 1962 p. 59, January 1961 p. 57, and February 1960 p. 69.

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SURCHARGES ON IMPORTS OF FISHERY PRODUCTS REMOVED:

All surcharges on fishery products imported by Canada were removed as of November 15, 1962. The removal of surcharges also applied to a long list of other imported food products.

Note: See Commercial Fisheries Review, September 1962 p. 67.

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PRODUCTION, UTILIZATION, AND FOREIGN TRADE IN MARINE-ANIMAL OILS, 1961 AND JANUARY-JULY 1962:

Production: Canadian production of marine-animal oils in 1961 was 77.1 percent above that in 1960, but only 17.0 percent above the 5-year average production in 1956-1960 (see table 1). The increase was due to greater production of herring oil in British Columbia. According to preliminary data, marine oil production on the Atlantic Coast in January-July 1962 amounted to 5,898,000

Table 1 - Canada's Production of Marine-Animal Oils, 1959-1961 and 1956-1960 Average				
	1961	1960	1959	5-Year Avg. 1956-60
. (1,000 Pounds)				
Atlantic Production:				
Cod oil	5,035	8,006	8,037	7,626
Other	4,998	4,589	4,358	5,934
Total	10,033	12,595	12,395	13,560
British Columbia Production:				
Herring oil	41,482	16,489	45,564	30,481
Total Production	51,515	29,084	57,959	44,041

pounds, as compared with 5,086,000 pounds in the same period of 1961. Herring oil production in British Columbia in January-July 1962 amounted to 16,356,000 pounds, as compared with 15,292,500 pounds in the same period of 1961. But 1962 fall and winter production of herring oil in British Columbia was not expected to equal that in 1961.

Use in Margarine and Shortening: The quantity of marine oils used in Canadian margarine and shortening in 1961 was much greater than in 1960. For margarine, usage was up 154.8 percent; for shortening, usage was up 121.3 percent (see table 2). The decided

Table 2 - Canada's Use of Marine-Animal Oils in Margarine and Shortening Production, 1959-1961 and 1956-1960 Average^{1/}

	1961	1960	1959	5-Year Avg. 1956-60
. (Million Pounds)				
Margarine:				
Production	184.0	166.6	152.5	144.0
Marine Oils:				
Quantity used in margarine	31.6	12.4	12.8	15.8
Percentage of total oils used	21.3	9.1	10.4	13.8
Shortening:				
Production	167.4	164.4	160.9	159.6
Marine Oils:				
Quantity used in shortening	16.6	7.5	5.4	15.5
Percentage of total oils used	10.0	4.6	3.3	9.7

^{1/}Refined-oil basis.

switch in Canada from vegetable oils to marine oils for margarine production began in the second quarter of 1961. It has paralleled a decline in the price of marine oils. The prices of British Columbia herring oil delivered at Toronto, Canada, in 1961-1962 were (in Canadian cents per pound): 1961: April 9.92; September 8.12; 1962: January 7.67; April 7.67; and July 7.1.

Accelerated use of marine oils continued during January-July 1962, when marine oils accounted for 30.0 percent of total oils used in margarine as compared with 16.9 percent in the same period of 1961. Marine oils ac-

Canada (Contd.):

counted for 11.0 percent of total oils used in shortening in January-July 1962, as compared with 9.5 percent in the same period of 1961. The increase in the use of marine oils has been mainly at the expense of soybean oil.

Foreign Trade: Canadian imports of marine oils (mainly fish oil) in 1961 showed a large increase, while Canadian exports of marine oils slumped (see tables 3 and 4).

Table 3 - Canada's Marine-Animal Oil Exports by Country of Destination, 1959-1961			
	1961	1960	1959
	... (1,000 Pounds) ...		
Cod-Liver Oil, Pharmaceutical,			
Crude and Sunrotted:			
United States	5,883	6,829	6,484
United Kingdom	1,338	1,543	996
Others	3	-	3
Total	7,224	8,372	7,483
Herring Oil, Industrial:			
United States	444	60	564
United Kingdom	515	21,760	21,287
Netherlands	-	597	-
Western Germany	-	597	1,411
Others	-	14	-
Total	959	23,028	23,262
Whale Oil:			
United States	129	64	634
United Kingdom	-	-	1,822
Netherlands	-	-	942
El Salvador	-	-	815
Western Germany	-	-	582
Total	129	64	4,795
Other Fish Oils:			
United States	519	225	4
Others	17	1	1/
Total	536	226	4
Total Exports	8,848	31,690	35,544
1/Less than 1,000 pounds.)			

The increase in imports was due mainly to larger shipments of fish oil from the United States and Iceland. The decline in exports was due mainly to a loss of foreign markets

Table 4 - Canada's Marine-Animal Oil Imports by Country of Origin, 1959-1961			
	1961	1960	1959
	... (1,000 Pounds) ...		
Cod-Liver Oil:			
United States	12	-	-
United Kingdom	917	1,353	2,099
Netherlands	-	-	30
Norway	48	122	71
Others	5	-	-
Total	982	1,475	2,200
Whale & Sperm Oil:			
United States	693	264	190
United Kingdom	350	298	40
Norway	96	67	68
Total	1,139	629	298
Other Fish Oils:			
United States	17,732	10,198	3,647
Japan	19	55	175
Iceland	12,711	-	-
Bahama Islands	948	-	-
Others	83	24	7
Total	31,493	10,277	3,829
Total Imports	33,614	12,381	6,327

for herring oil. Herring oil exports dropped from over 23 million pounds in 1960 to less than one million pounds in 1961.

In January-July 1962 marine oil imports of 1,139,000 pounds were 68.4 percent below imports of 3,611,000 pounds in the same period of 1961. By type, marine oil exports in January-July 1962 (with comparable data for the same period in 1961) were: fish oil 1,011,000 pounds (3,334,000 pounds in 1961); cod-liver oil 18,000 pounds (141,000 pounds in 1961); and whale and sperm oil 110,000 pounds (136,000 pounds in 1961).

In January-July 1962, marine oil exports totaling 4,940,000 pounds were 10.9 percent below exports of 5,543,000 pounds in the same period of 1961. By type, marine exports in January-July 1962 (with comparable data for the same period in 1961) were: fish oil 126,000 pounds (725,000 pounds in 1961); cod-liver oil 4,221,000 pounds (4,809,000 pounds in 1961); whale oil 593,000 pounds (9,000 pounds in 1961). (U. S. Foreign Agricultural Service Report, Ottawa, October 5, 1962.)

Note: See Commercial Fisheries Review, July 1961 pp. 50-51.

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BEDFORD INSTITUTE OF OCEANOGRAPHY OPENS:

Canada's new center of marine sciences on the Atlantic Coast was officially opened on October 25, 1962. The main building contains 22,000 square feet of laboratory space that is fitted out with the latest in scientific equipment. The office wing contains 55 offices, a board room, a library, and a cafeteria. The building is designed to accommodate a staff of 300 scientists and supporting staff. About one third of the complement has been hired. Full complement is expected by 1965 and will include oceanographers, hydrographers, fisheries research scientists, geophysicists, underwater geologists, and engineers.



Bedford Institute of Oceanography.

Canada (Contd.):

Between the main building and the dock area is the depot building with equipment storage and staging areas for shipboard cruise material and instruments. It also contains workshops for carpenters, machinists, welders, and painters. The docking area beyond the depot building has an extensive loading area with berthing facilities for 10 vessels. It includes a 700-foot quay and a 500-foot jetty. There is room for future expansion to three jetties.

The Institute was built at a cost of C\$4.5 million and will house the scientists and engineers of both the Department of Mines and Technical Surveys and the Fisheries Research Board, who are studying Canada's Atlantic and sub-Arctic oceanic and estuarine areas.

The Institute will have one of the world's most modern fleet of research vessels. This fleet will compromise the East Coast vessels of the Canadian Hydrographic Service, the vessels of the Atlantic Oceanographic Group of the Fisheries Research Board, and four new vessels, the largest of which will be the \$6.5 million C.G.S. Hudson. The Hudson will work mostly in the Atlantic and Arctic areas; however, in line with Canada's policy of co-operation in international programs, Canadians expected that she will also participate in international oceanographic expeditions anywhere in the world.

Note: See Commercial Fisheries Review, October 1962 p. 48.

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ATLANTIC COAST SEA-SURFACE ENVIRONMENTAL CHARTS:

An important advance in the rapidly developing science of oceanography in Canada is the regular production, in RCN Dockyard at Halifax, of charts depicting oceanographic conditions off Canada's east coast. At present used mainly by the research worker, the charts may well prove valuable in the future to fisherman in the location of new fishing grounds.

The charts are somewhat similar to weather maps since they depict sea-temperature distribution, variation of sea temperatures, etc. They represent the first Canadian effort to present data on short-term changes in the characteristics of the temperate seas bordering Canadian coasts. They are produced in the RCN Dockyard from re-

ports of observations, made and sent by radio, from ships and/or units of a number of Federal agencies: the Royal Canadian Navy, the Royal Canadian Air Force, Defense Research Board, Fisheries Research Board, and the Department of Mines and Technical Surveys, and from United States vessels as well.

Naval ships, government survey vessels, etc., by prearrangement, make bathythermographic observations. They radio their findings to the Dockyard which receives hundreds of reports a month from all parts of the north-west Atlantic Ocean. In the case of sea-surface temperature, some 200 reports are received daily.

By showing changes in sea temperature, the charts should prove most useful to fisherman. The cod fishing grounds in the north-west Atlantic, for instance, shift from year to year, and those movements are apparently associated with changes in temperature. With more study it should be possible to use the charts to indicate the probable direction of those movements.

The new Bedford Institute of Oceanography will be a valuable new source of assistance in the production of the charts. Not only will the Institute direct research to developing improved methods of processing the data for the charts but its ships will be additional sources of information on the waters in which they work.

* * * * *

NEW FISHERIES RESEARCH VESSEL FOR WEST COAST:

The G. B. Reed, newest and largest of Canada's fisheries research vessels on the Pacific coast, underwent trials and was due to be handed over to the Fisheries Research Board of Canada this fall, the Parliamentary Secretary to the Fisheries Minister announced on October 19, 1962.

Launched in June 1962, the G. B. Reed is a sistership to the research vessel A. T. Cameron which has been carrying out widespread scientific operations in the North Atlantic Ocean for the past four years.

Built in Esquimalt, British Columbia, the vessel brings to the Board's scientists in the Pacific Area the benefits of a specially designed and modern floating laboratory for their work in studying the fishery resources of the Northeast Pacific Ocean.

Canada (Contd.):

The new vessel has a range of 8,500 miles, accommodations for 9 scientists and 5 laboratories furnished with the latest in scientific equipment. With the great impetus that has occurred in the Pacific fisheries in the past decade, the G. B. Reed is slated to play a prominent role in maintaining Canada's position in world fishing affairs. (Canada's Department of Fisheries, Ottawa, October 19, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 64.



Chile

FISH MEAL INDUSTRY EXPANSION:

An annual production of 600,000 metric tons of fish meal at Iquique, Chile, by 1965 is one of the goals of Corporacion de Fomento de la Produccion de Chile (CORFO), a national development corporation. During October 1962, the Council of CORFO ceded 35,360 square meters of land in the port area of Iquique for another fish meal plant. The Inter-American Development Bank, according to a local report, has approved \$5 million in credits for this purpose. The General Manager of CORFO has expressed satisfaction at the progress being made in Iquique in the development of the fishing industry. In addition to fish meal, the 1965 annual production goals at Iquique include 37,000 tons of canned fish, 30,000 tons of frozen fish, and 120 tons of fish and shellfish for local consumption. If the objectives are realized, Iquique would earn about \$70 million a year in foreign exchange, according to the General Manager.

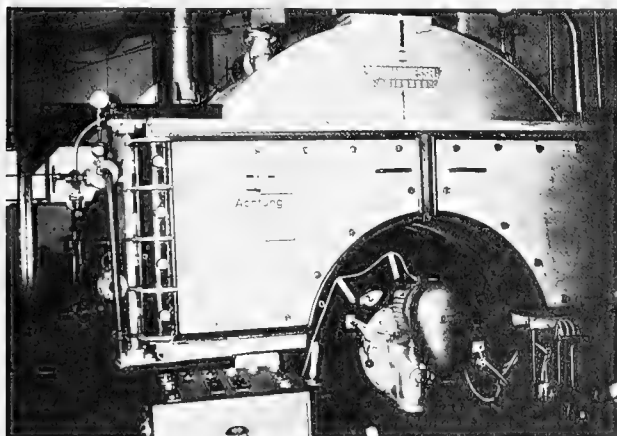


Fig. 1 - Boiler room of fish meal plant in San Antonio, Chile.



Fig. 2 - Fish meal being bagged at a fish meal plant in San Antonio.

Expansion of fish meal production in other ports in northern Chile is also planned. A Canadian firm recently requested authorization for the construction of a fish meal plant in Tocopilla, Chile. (United States Consulate, Antofagasta, October 31, 1962.)



Denmark

FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JANUARY-OCTOBER 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first ten months of 1962 were 18.9 percent greater than in the same period of 1961, mainly because of an increase of 120.7 percent in exports of herring fillets. Exports of flounder and sole fillets increased 9.6 percent, but exports of cod and related species declined 5.3 percent. During the first ten months of this year exports to the United States of fresh and frozen fillets and blocks of about 10.6 million pounds (mostly cod and related species) were up from the exports of about 10.0 million pounds in the same period of 1961.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, Jan.-Oct. 1962 1/

Product	October		Jan.-Oct.	
	1962	1961	1962	1961
..... (1,000 Lbs.)				
Fillets and Blocks:				
Cod and related species	1,907	1,406	25,840	27,286
Flounder and sole	3,383	2,781	24,546	22,389
Herring	3,809	1,619	20,311	9,201
Other	66	103	553	1,030
Total	9,165	5,909	71,250	59,906
..... (Short Tons)				
Industrial Products:				
Fish meal, fish solubles, and similar products	6,431	5,590	59,816	45,081
1/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.				

Denmark (Contd.):

Denmark's exports of fresh and frozen fish fillets and blocks during October 1962 were 55.3 percent above exports in the same month in 1961. Of the total exports, about 836,000 pounds (mostly cod and related species) were shipped to the United States in October 1962 as against 431,000 pounds in the same month in 1961. The leading buyers of frozen fillets in October 1962 were West Germany and the United Kingdom.

Denmark's exports of fish meal, fish solubles, and similar products in January-October 1962 were 32.7 percent greater than in the same period a year earlier. Exports to the United States during the same period were 110 tons in 1962 as against 28 tons in 1961.

During October 1962, Denmark's exports of fish meal, fish solubles, and similar products were 15.0 percent above the amount shipped out in the same month of 1961. The principal buyers were the United Kingdom, Finland, and West Germany.

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FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JANUARY-SEPTEMBER 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first nine months of this year were 15.0 percent greater than in the same period of 1961, mainly because of an increase of 117.6 percent in exports of herring fillets. Exports of flounder and sole fillets increased 7.9 percent, but exports of cod and related species declined 7.5 percent. During the first nine months of this year exports to the United States of fresh and frozen fillets and blocks of about 9.8 million pounds (mostly cod and related species) were up from the exports of about 9.5 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during September 1962 were 1.1 percent above exports in the same month in 1961. Of the total exports, about 168,000 pounds (mostly cod and related species) were shipped to the United States in September 1962 as against 378,000 pounds in the same month in 1961. The leading buyers of frozen fillets in September 1962 were the United Kingdom and the Federal Republic of Germany.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, Jan.-Sept. 1962 ¹				
Product	September		Jan.-Sept.	
	1962	1961	1962	1961
	..... (1,000 Lbs.)			
Fillets and Blocks:				
Cod and related species	1,356	1,484	23,933	25,880
Flounder and sole	3,265	3,996	21,163	19,608
Herring	2,560	1,594	16,502	7,582
Other	10	40	487	927
Total	7,191	7,114	62,085	53,997
	..... (Short Tons)			
Industrial Products:				
Fish meal, fish solubles, and similar products	4,730	5,957	53,385	39,491

¹/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.

Denmark's exports of fish meal, fish solubles, and similar products in January-September 1962 were 35.2 percent greater than in the same period a year earlier. Exports to the United States during the same period were 110 tons in 1962 as against 28 tons in 1961.

During September 1962, Denmark's exports of fish meal, fish solubles, and similar products were 20.6 percent below the amount shipped out in the same month of 1961. The principal buyers were the United Kingdom, Finland, and West Germany.

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FISHERIES TRENDS, JANUARY-SEPTEMBER 1962:

Landings: Landings of fish and shellfish at Danish ports during the first nine months of 1962 were 18 percent greater than the previous year and 9 percent larger than the record year (1959) for the same periods. With normal weather, the total 1962 catch was ex-



Fig. 1 - Gammel Strand fish market in Copenhagen. Live eels and plaice are sold in this market. Copenhagen is a market for fishery products rather than an important fishing port.

Table 1 - Danish Fishery Landings, January-September 1962 with Comparisons

Species	1962	1961	1/1959
..... (Metric Tons)			
Landings in Denmark by Danish Vessels:			
Salt-Water Fish:			
Plaice, dabs, & flounders	41,100	38,600	27,300
Cod	48,200	50,600	47,300
Herring	196,100	186,600	198,100
Other salt-water fish ² /	275,800	198,200	236,700
Total salt-water fish	561,200	474,000	509,400
Fresh-Water Fish and Shellfish:			
Pond trout	5,700	5,700	4,900
Fresh-water fish	2,500	2,500	2,400
Mussels & starfish	10,800	8,800	18,500
Shrimp, lobsters, etc. ³ /	5,100	4,400	3,300
Total fresh-water fish and shellfish	24,100	21,400	29,100
Total fish and shellfish	585,300	495,400	538,500
Landings in Denmark by Foreign Vessels	77,000	41,900	54,400
Danish Landings in Foreign Ports of:			
United Kingdom, Sweden, & Holland	5,500	7,100	4,400

¹/Year of record total catch of 667,800 metric tons.

²/Mostly industrial fish.

³/Mostly deep-water shrimp and Norway lobsters.

Source: Preliminary data from Ministry of Fisheries.

Denmark (Contd.):

pected to surpass 700,000 metric tons and easily establish a new record. The increased landings of industrial fish for fish meal and oil and for brook and rainbow trout and animal food were 16 percent greater than in 1959, reflecting the recovery of the reduction industry as world market prices for fish meal improved.

Exports: For the first nine months of 1962 exports were up 19 percent in value and 11 percent in volume as compared with the same period of 1961 (a record year). The largest gains occurred in exports of fresh and frozen herring, canned fish, and fish meal.

Exports to Common Market and EFTA Countries: The value of Danish fishery exports taken by Common Market (EEC) and European Free Trade Association (EFTA) countries increased in 1962 as compared with the first nine months in 1961, but the 38-percent gain in the Common Market countries was so much greater that they now are significantly better customers than Denmark's EFTA partners.

Exports to United States: Danish fishery exports to the United States for the first nine months of 1962 were 14 percent greater in value than for the same period in 1961--about the same increase as in the EFTA countries. Canned herring accounted for the major share of the gain, stimulated by the short Maine

Table 2 - Danish Fishery Products Exports, January-September 1961/62

Products	1/1962			1961		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
To all countries	213,700	404,600	58,663	191,800	338,900	49,137
To United States:						
Fresh and Frozen Fillets:						
Cod	4,300	13,100	1,899	4,100	12,200	1,769
Flatfish	1/	100	15	1/	200	30
Other salt-water fish	300	1,800	261	300	1,400	203
Pond trout and eggs	600	4,600	667	800	6,200	899
Lobsters	200	4,500	652	200	3,300	478
Others	1/	1/	1/	100	100	15
Total fresh and frozen exports to U. S.	5,400	24,100	3,494	5,400	23,400	3,394
Processed:						
Semipreserves	1/	100	15	1/	100	15
Canned:						
Herring and brisling	1,400	5,500	797	600	2,400	348
Other	200	1,500	217	100	1,100	159
Others	200	200	30	300	600	87
Total processed exports to U. S.	1,800	7,300	1,059	1,000	4,200	609
Total exports to U. S.	7,200	31,400	4,553	6,500	27,600	4,003

1/ Less than 50 metric tons.

Note: One Danish krone equals about US\$0.145.

Source: Ministry of Fisheries.



Fig. 2 - Tuna fishery in Øresund. Bluefin tuna landings in Denmark vary considerably from year to year. Most of the catch is made in the North Sea.

sardine pack in 1961. In view of the normal Maine sardine pack in 1962 and lower United States prices this fall, Danish sardine canners do not expect to maintain the same sardine exports to the United States. Frozen lobster tail exports increased about one-quarter in quantity and one-third in value. Cod fillet exports were up only slightly in quantity and value. Pond trout exports to the United States are continuing to decrease with better markets and prices available in Europe.

Vessels Using Boom Trawl: A number of Esbjerg cutters probably will follow the lead of three vessels from that port which have successfully adopted the Dutch boom trawl for catching sole. This type gear is relatively unknown in Denmark, but has been used

Denmark (Contd.):

for years by Dutch and German vessels. It consists of two trawls which are fished simultaneously from 23-foot booms, one off each side of the vessel. The trawls are towed with the booms horizontal, but are hauled in with the booms in a vertical position. The trawls are fished with and against the tide for about one hour. One Danish vessel made 4 tows in 7 hours, catching 823 pounds of sole. German vessels also have used the gear with good success for plaice. Rigging a vessel with the new gear costs US\$1,305-\$1,450, which is less costly than a Danish seine. The gear is not legal for use within the Danish three-mile limit. Opinions are divided as to its effect on the bottom and young fish but it fishes well and the quality of the catch is excellent. Fishermen averaged 32.1 U. S. cents a pound for sole in 1961 as compared with a record average of 38.2 cents in 1958.



Fig. 3 - Hyvide Sande, a Danish fishing port. Its fishing craft, such as the RI.55 catch mostly plaice and herring.

"Bubble Curtain" Used with Eel Traps: Preliminary experiments with eel gear using a "bubble curtain" to divert or guide the eels into traps has been encouraging in tests sponsored by the Danish Fisheries Association and Fisheries Ministry personnel. A

perforated plastic hose and an air compressor produce a wall of bubbles which replaces the line of stakes normally installed between the traps. Catches have been about the same with the new device as with control gear in the same area. If further experimentation confirms the initial success there should be considerable savings in the cost and upkeep of the stakes used with the present gear.

Minimum Prices and Size Limits: The establishment of minimum prices and minimum size limits for plaice, long stalled by the inability of the two largest fishermen's organizations to agree on a submission to the Fisheries Ministry, is moving off dead center again. The Danish Fisheries Association now is planning to proceed without the cooperation of the West Jutland Association, although requesting the concurrence of the latter's two largest units in Esbjerg and Hirtshals. A minimum size limit of 270 millimeters (10 $\frac{5}{8}$ inches) and a minimum price of 6.9 U. S. cents a pound were the earlier goals. Now some are mentioning a minimum price of 7.9 cents a pound, the price recently guaranteed a large cooperative of producers by a large filleting plant in Fredericia in East Jutland.

The advent of minimum prices for plaice undoubtedly will be followed by requests for similar action on other marine species.

Fishermen in Skagen, the principal Danish shrimp port, have proposed for discussion in the Fisheries Commission a minimum price of 17.1 cents a pound for deep-water shrimp, and that all shrimp be sold at auction. The average auction price last year was 19.8 cents a pound. Some vessels now contract to sell their catches outside the auction to shrimp canneries for 13.2-16.5 cents a pound.

Cutters Sought by Philippine Fisheries Ministry: Eight Danish cutters of about 100 gross tons each have been offered the representative of the Philippine Fisheries Ministry during a visit to Copenhagen to seek fishing vessels for his country. Prices asked are reported to be between US\$87,000 and \$101,500. A new 80-ton cutter now costs over US\$145,000. Danish fishermen would sail the cutters to the Philippines and remain for several months to teach the local fishermen Danish fishing techniques. Earlier negotiations for Danish cutters initiated by a United States fishing company in the Philippines fell through because the Danish fishermen, who were to remain in the Philippines for two years, believed too much economic risk was involved.

Denmark (Contd.):

International Fisheries Fair in 1964: The Fifth International Fisheries Fair to be held in Copenhagen, September 11-20, 1964, will be supported officially by the Fisheries Council, an association of Danish fishery associations. It is reported that 80 percent of the exhibition area already has been reserved by previous exhibitors.

Seaworthiness of Steel Cutters Questioned: Denmark's largest steel cutter, Nina Nordfish (193 gross tons) capsized and sank in heavy weather in October 1962 with a loss of three lives. Three similar cutters and 14 of their crew members were lost in a February 1962 storm. On November 19, a fifth steel cutter, fully loaded with industrial fish, sank after drifting two days with a 40 degree list. It is reported that the cutters do not right themselves readily when struck by a cross sea. Numerous other cutters have had this difficulty besides those which were lost. An earlier request for initiating an immediate investigation of their seaworthiness was not approved by the Government because of the financial situation. It was suggested it be delayed until the 1963/64 fiscal year. A renewed request for immediate action is now up for consideration. A Professor of the Polytechnical Teachers College has developed plans to carry out the stability and model tests which will cost US\$13,775 and take about a year. He recently concluded tests of wooden cutters which demonstrated that their stability is adversely and seriously affected when they are heavily loaded, and heading in to heavy seas at 5 or 6 knots.

Of the approximately 1,200 Danish cutters over 20 gross tons, about 100 are steel cutters built in the last 5 or 6 years and are mostly in the 100-ton category. The change from the traditional wood cutters was made to get more fishing days per year, a greater radius of action, larger hold capacity, and more earning power. Critics of the vessels claim their difficulties are due to too powerful engines, faulty maneuvering, inadequate ballast, too high a center of gravity because of the large pilothouse and superstructure, and an inability to shed quickly the water coming aboard from large seas.

Porpoise Research: Research on the sense organs of porpoises or dolphins, financed by a North American Treaty Organization grant, is under way in a blocked-off

oil refinery harbor in the northwest corner of the Danish island of Fyn. The investigations have military applications, but the scientists are quoted as saying that successful research could lead to new forms of fishing by teaching porpoises to herd fish into schools and drive them into the fishermen's nets. The research was begun several years ago by scientists of the Marine Biological Institute, Den Helder, Holland and the French Laboratoire Acoustique Animal. When efforts to bring living porpoises to their laboratories failed, they began the research in Denmark near an area where porpoises are abundant.

Four porpoises have been captured and are in the basin, tame enough to take herring by hand. Six or eight more were expected to be caught. Nets are used to capture and prevent any damage to the mammals, such as might be caused by darts which would render the porpoises unconscious. (Regional Fisheries Attache for Europe, Copenhagen, reports of November 7, 14, and 21, 1962.)

* * * * *

SALMON FISHERY IN EASTERN BALTIC SEA:

Salmon are caught in the Eastern Baltic Sea by fishing fleets from Denmark, Sweden, Finland, Poland, and West Germany. The Danish fleet of about 150 cutters took 1,410 metric tons (3.1 million pounds) of salmon during the past season (July 1961-June 1962). This is about three-fifths of the total catch. According to a Fisheries Ministry biologist, the Danish salmon catch in 1961/62 not only is the best since records on total catch became available in 1952/53 but probably the greatest ever reported.

Table 1 - Danish Salmon Catches in the Eastern Baltic Sea
(Drawn Weight)

Season	1,000 Lbs.	Season	1,000 Lbs.
1961/62	3,102	1956/57	2,358
1960/61	2,730	1955/56	1,417
1959/60	1,637	1954/55	2,132
1958/59	2,435	1953/54	1,630
1957/58	1,674	1952/53	1,888

Landings are concentrated in the fishing ports of Bornholm (the small Danish island just south of the lower end of Sweden), but the cutters making up the fleet come from ports all over Denmark. Most of the Danish catch is taken on hooks, but there is a drift-net fishery when the weather is good. Although some anchored long lines are used,

Denmark (Contd.):

the greater number are drifted in the open Baltic Sea. The salmon season for the Danish cutters may begin as early as August, but the best fishing months are October to January. Over 68 percent of the catch was taken during those months in the 1961/62 season. A typical 40-ton Danish cutter carries a crew of four and fishes from September or October to about May.

Table 2 - Monthly Danish Catches in Eastern Baltic Sea, 1961/62 Season (Drawn Weight)					
Month	1,000 Lbs.	Percent	Month	1,000 Lbs.	Percent
July . . .	-	-	January	440	14.1
August	8	0.3	February	190	6.1
September	129	4.2	March	274	8.8
October	342	11.0	April	185	6.0
November	638	20.6	May	133	4.3
December	705	22.7	June	58	1.9

The long-line gear used in the salmon fishery consists of a main line (each 16 to 20 meters or 52 to 66 feet) to which are attached nylon gangions and hooks. From 1,500 to 2,000 hooks are used and more than 30 kilometers (18.6 miles) of line may be set out. Bait must be of the best quality. One frozen hornfish will make bait for 5 to 7 hooks. Large frozen brisling, available about Christmas, are better bait and herring also are used. The hooks are baited and the long line is set in the dark as the salmon bite best at daybreak. Also, the poorer the weather the better they bite, so gear may be set in a gale wind. The set begins with the setting of a buoy which is followed by other buoys at intervals of every 80 hooks, seldom less than 25 in all. Each buoy carries a consecutively numbered flag and often is supplied with a battery-powered electric lamp. When the set is completed the gear in the water is valued at 9,000-10,000 kroner (US\$1,305 to \$1,450).

The gear is hauled about noon or 1:00 p.m., a task often taking 9 or 10 hours. Since fishing occurs in waters heavily traveled by vessel traffic, gear often is lost in whole or in part. Practically all the cutters carry navigating equipment in order to pinpoint their positions when setting and picking up the gear. The hooked salmon are taken on board with a net and handled carefully to avoid bruising. They are eviscerated immediately and packed in ice. Salmon already hooked on the long line often are taken by the numerous seals and occasional porpoises.

From a sample of 16 cutters which took 5.4 percent of the total catch in the 1961/62

season, Danish biologists reported that 16.5 salmon were taken per 1,000 hooks. The average price to the fisherman for all Danish catches of salmon (drawn weight) during the calendar year of 1961 was 13.33 kroner a kilo (88 U. S. cents a pound) as compared with 14.54 kroner a kilo (96 U. S. cents a pound) in 1960, the record year for prices.

At the beginning of the 1962/63 season there seemed to be abundance of small salmon weighing 2.2 to 4.4 pounds. Salmon weighing 5½ to 11 pounds seemed to be few in number, but the 11 to 19.8 pounds size was abundant. The largest salmon taken weigh mostly 22 to 24.2 pounds with occasional giants weighing 39.6 to 44 pounds each.

Table 3 - Size Distribution of Danish Catch of Salmon, 1961/1962 (Drawn Weight)			
Market Categories:			
Kilos	Pounds	Number	Percent
9 and over	19.8 and over	12,000	3.3
7 - 9	15.4 - 19.8	24,600	6.8
5 - 7	11.0 - 15.4	37,600	10.4
3 - 5	6.6 - 11.0	162,000	44.9
1 - 3	2.2 - 6.6	124,700	34.5
Under 1	Under 2.2	200	0.1
Total		361,100	100.0
Average weight:			
3.9		8.6	

Danish exports of fresh salmon go mostly to Sweden, Switzerland, Finland, Norway, and West Germany. Exports of frozen salmon are taken mainly by France, Norway, Switzerland, and the United Kingdom. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, November 14, 1962.)



Ecuador

NEW TARIFF SCHEDULE RAISES DUTIES SHARPLY ON U. S. CANNED FISH:

The increased duties provided in the new Ecuadorean tariff schedule (effective July 2, 1962) on imports of sardines and salmon are clearly protectionist. Possibilities for obtaining a reduction in duties on sardines are not considered good due to Government of Ecuador interest in promoting the domestic fish industry. Although there are no sardines in Ecuadorean waters, the local products "tunalette" (tuna) and mackerel appear to be accepted substitutes on the Ecuadorean market.

The effects of the new Ecuadorean customs schedule on the imports into Ecuador of United States canned pilchards or sardines is com-

Ecuador (Contd.):

plicated by the fact that the 1962 schedule has changed the classifications in this category, so that exact comparison or determination of the effects of the new schedule is impossible.

Under the former schedule, "sardines and salmon" (Section 120) comprised one classification, which was assessed a duty rate of 5 sucres¹/ per net kilo (about 12.5 U. S. cents a pound) plus a 20 percent ad valorem duty. In 1960, total imports in that category had an f.o.b. value of 5 million sucres (US\$275,028) of which imports from the United States accounted for approximately 4 million sucres (US\$220,022). According to Anuario de Comercio Exterior, total duties paid on United States imports in 1960 amounted to about 4.9 million sucres (US\$269,527). In 1961, total imports were valued at 2.6 million sucres (US\$143,014) and United States imports paid duties also amounting to 2.6 million sucres (US\$143,014).

The former schedule also carried a classification of "prepared fish, others" which included tuna and carried a rate of 18 sucres per net kilo (about 44.9 U. S. cents a lb.) plus a 20 percent ad valorem duty. Total imports amounted to 155,000 sucres (about US\$8,526) f.o.b., of which, United States imports were about 115,000 sucres (\$6,327). Duties imposed on United States imports amounted to about 175,000 sucres (US\$9,626).

The classifications and duty rates under the 1962 schedule (Section 120) are as follows: Sardines, 12 sucres per net kilo (29.9 U. S. cents a lb.) plus 10 percent ad valorem; Salmon, 7.50 sucres per net kilo (18.7 U. S. cents a lb.) plus 10 percent ad valorem; Tuna, 18 sucres per net kilo (44.9 U. S. cents a lb.) plus 20 percent ad valorem; and Prepared fish, others, 15 sucres per net kilo (37.4 U. S. cents a lb.) plus 10 percent ad valorem.

A rough estimate of the differences in duties may be obtained from the following: The classification "sardines and salmon" accounted for total duties of 4.9 million sucres (US\$269,527) in 1960. Assuming that the largest percentage of imports in that category was for sardines, and calculating on the basis of 1960 import figures, duties paid on sardines under the July 1962 import schedule would amount to 10.3 million sucres (US\$566,556), or more than double previous figures.

¹/Values converted at rate of 18.18 sucres equal US\$1.

There are no appreciable changes in duty rates on other fish products. "Crustaceans and mollusks" (Section 121 of the new schedule) shows no change in rates. Exact comparisons with Sections 19, 20, and 21 of the old schedule is impossible because of changed classifications. In any event, 1960 imports from the United States were minimal, totaling only 3,800 sucres (US\$209) for both categories of fresh fish and smoked fish. The new schedule makes specific provision for the free entry of breeding stock.

One of the specific intents of the 1962 customs schedule has been to provide rates which will make attractive the establishment of new industries or which will give impetus to the further development of existing industry. The Director of the Tariffs Section of the Ministry of the Treasury states that the new tariffs on fish products are frankly protectionist and are expected to reduce greatly importation of sardines, the principal fish import into Ecuador. According to Treasury calculations the full tariff incidence on sardines and salmon under the old schedule was 117 percent on f.o.b. value whereas under the new schedule the tariff on sardines is 251 percent and on salmon 161 percent. The tariff on tuna remains the same at 250 percent f.o.b. value. The recently established 40-mile restricted fishing zone is an indication of pressures being exerted for development of the domestic fishing industry.

It is doubtful that a more favorable duty for the importation of United States canned sardines can be obtained. A wholly-owned subsidiary of a United States firm is producing and is marketing a so-called "tunalette" which is cut and packaged in a form similar to sardines and which appears to be fully competitive with imported sardines. There also are three small canneries in Guayaquil canning mackerel, also a sardine substitute. It seems probable that attempts will be made to continue to develop this portion of the industry which will, for the time being, meet local demands, even though not producing true sardines. Until a greater demand develops, local production will probably be considered sufficient to meet the local demand and it can be expected that imports of canned fish from the United States will show additional declines as the result of the new schedules. (United States Embassy in Quito, September 12, 1962.)



Faroe Islands

FISHERY TRENDS, NOVEMBER 1962:

New Filleting Plant to Export to U. S.:

The first large fish filleting plant in the Faroe Islands will be completed early in 1963. Its production will be exported primarily to the United States and Great Britain. The plant is being constructed as a part of the largest fishing activity in the islands. It is being equipped with the most modern filleting and freezing equipment, and will produce 100 metric tons of quick-frozen fillets each 24 hours. The storage capacity will be 2,000 tons. The firm's fleet of smaller vessels will supply the plant with raw material, mainly fish from home waters.

Frozen Fillet Exports Up in First Nine Months: Exports of frozen fillets during the first nine months of 1962 were valued at 2,200,000 kroner (US\$319,000), 41 percent greater than for the same period in 1961.

Sales of fresh fish to the British market totaled 16,700,000 kroner (US\$2.4 million), 9 percent less than in 1961, because most of the new steel vessels entered the fishery later than usual after making salt-fish trips to Greenland.

In the last 12 months the Faroese fleet has increased by 14 new steel vessels (3,500 gross tons), according to a report of November 21 from the Regional Fisheries Attache in Europe, United States Embassy, Copenhagen.



Fiji Islands

TUNA BASE PLAN:

Plans for the establishment of a joint Japanese-British tuna base at Levuka, Fiji Islands, initially proposed by a Japanese Diet member affiliated with the Democratic-Liberal Party, have been completed and the Japanese Fisheries Agency is expected to approve the venture. The base is being established jointly by Japanese and British interests.

Reportedly, the Fijian tuna base is initially likely to be granted a tuna production quota of 5,000-6,000 metric tons. The South Pacific Ocean Fisheries Cooperative, which is to manage the venture, is said to have already

completed arrangements with practically all of the owners of 15 surrounding-net fishing vessels (whose vessels were withdrawn from the depressed coastal surrounding-net fishery and who were granted licenses to construct 100-ton tuna vessels in their places) to fish for tuna out of its Fijian base. In addition, the Cooperative hopes to obtain special licenses to construct additional tuna vessels under 100 tons gross for assignment to the Levuka base.

Earlier press reports indicated that the Fijian Government, in hopes of encouraging the establishment of the base, was reported to be willing to grant 7-year resident permits to Japanese fishermen, technicians, and their families emigrating to the Fiji Islands, and also would grant special tax considerations. According to those reports, the base facilities would include a cannery and cold-storage facilities, and thirty 99-ton tuna vessels would be assigned to the base during its first year of operation. (Suisan Tsushin, November 21, 1962, and other publications.)



France

ENTRY HELD UP OF MOROCCAN FROZEN SARDINES:

A shipment of frozen Moroccan sardines to France in October 1962 was placed in port storage until the French Sardine Marketing Authority decides whether to permit entry. The shipment was Morocco's first attempt to resume exports of frozen sardines to the important French market since shipments were suspended in July 1962. The shipment resulted in renewed though nonviolent objections by fishermen in the French port. Frozen tuna from Morocco was included with the shipment of frozen sardines. The frozen tuna was allowed entry by France. (United States Embassy, Rabat, November 9, 1962.)



German Federal Republic

FINANCIAL DATA ON STERN-TRAWLER FACTORYSHIPS:

The following financial data on West German stern-trawler factoryships were obtained from trawler companies and shipyards in West Germany:

Private Financing: Most trawler operators normally are able to finance about 20 to 40 percent of the cost of new ves-

German Federal Republic (Contd.):

sels, while banks provide for a little over 50 percent. The remainder of the cost is sometimes paid by the bank and guaranteed by the local government.

Government Subsidies: Trawler operators in the port of Bremerhaven stated that financial assistance for vessel construction from the Federal Government consisted of the following:

(1) A loan of up to 25 percent of the ship's total cost, with a maximum payment of DM 1.5 million (US\$375,000), at 4 percent interest for 14 years (repayable only when the vessel operates at a profit). The total Government appropriation for this purpose in 1962 was only DM 8 million (US\$2 million).

(2) Government assumption of up to 3 percent of the interest rate paid by vessel operators on bank loans for those vessels which lost money in 1960 and 1961 and which foresee a loss in 1962. Only 3 or 4 trawler operators are reportedly eligible for such assistance.

(3) The scrapping premium of DM 400 (US\$100) per ton for obsolete vessels; however, an average of only DM 160,000 (\$40,000) is paid per vessel.

Construction Costs: The estimated composition of shipyard construction costs were:

- (a) Labor - 30-35 percent.
- (b) Materials - 35-50 percent.
- (c) Machinery - 20-30 percent.

Gear and equipment cost estimates for stern-trawler factoryships were:

- (a) Fishing gear - DM 50,000-150,000 (US\$12,500-37,500)
- (b) Freezing equipment - DM 180,000-500,000 (US\$45,000-125,000)
- (c) Processing equipment - DM 200,000-400,000 (US\$50,000-100,000)

Equipment for beheading, filleting, and skinning ocean perch and cod is installed on some stern-trawler factoryships.

Operating Costs: A breakdown of crew wages was not available, but one company reported that a crewman's regular salary and his percentage of the value of the catch totaled about DM 900 (US\$225) monthly. Another company stated the captain normally received 4.5 percent of the value of the catch.

One company made the following estimate of trawler operating costs on a daily basis:

(1) DM 6,000 (US\$1,500) per day for a vessel of 1,000 British registered tons (BRT) with a daily freezing capacity of 10 metric tons, cold-storage capacity of 90 tons, room for 300 tons of iced fish, fish meal production capacity of 20 tons per day, 35-man crew, and engine of 2,000 horsepower.

(2) DM 7,500 (US\$1,875) per day for a vessel of 1,200-1,600 BRT with a daily freezing capacity of 15-20 tons, cold storage capacity of 250 tons, room for 175 tons of iced fish, fish meal production capacity of 20 tons per day, 42-man crew, and engine of 2,000 horsepower.

Landings and Sales: The annual gross sales of one trawler of 1,000 BRT with daily operating costs of DM 6,000 (US\$1,500) as described above have been estimated at DM 2,400,000 (US\$600,000) based on annual landings of 1,765 metric tons of fresh fish, 515 tons of

frozen fish, 304 tons of salted fish, 311 tons of fish meal, and 99 tons of fish oil. The estimate is based on 196 days actual fishing time. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, October 17, 1962.)

Note: One Deutsche Mark (DM) equals US\$0.25.



Ghana

AMERICAN FISHERMEN TRAIN CREWS ON NEW TUNA PURSE-SEINE VESSELS:

It has been learned that American rather than British fishermen are training the crews on four new Ghanaian tuna purse-seiners recently purchased from a British shipyard. The United States mission was sent to Ghana by the United States Agency for International Development (AID) upon the request of the Ghanaian Government. The training mission consists of two American tuna vessel captains and two American tuna fishermen.

The new Ghanaian vessels are crewed with British captains, mates, and engineers experienced in trawl fishing. Ghanaian fishermen previously trained on United States tuna purse-seiners are working on the vessels as fishermen. The British and Ghanaian crews are expected to be operating the vessels efficiently as tuna purse-seiners after a year of training by the American fishermen.



Greece

EEL PRICES, AUGUST 1962:

At the auction in Patras, Greece, August 25, 1962, the highest bids for eels from the lagoons of western Greece were made by a fishery firm in the Netherlands.

Patras Eel Auction Prices, August 25, 1962		
Source of Eels	Prices	
	Drachmas/Kilogram	U. S. Cents/Pounds
Preveza Lagoon	24	36.3
Vonitsa "	30-32	45.3-48.4
Kotychi "	20.5	31.0
Messolonghi "	23.5	35.5

A fishery firm in the Netherlands also signed a contract to buy eels from the Greek lagoons of Mourghia (Pyrgos) and Agoulinitza for 28 drachma per kilogram (42.3 U.S. cents per pound). (Alieia, September 1962.)

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Greece (Contd.):

LANDINGS OF FROZEN FISH BY ATLANTIC FREEZER-TRAWLER FLEET:

During September 1962, five Greek freezer trawlers landed 1,831 metric tons of frozen fish, as compared to five trips in August 1962 with 1,385 tons. In September 1961, three vessels landed 635 tons of frozen fish.

The total landings of frozen fish during January-September 30, 1962, totaled 12,888 tons as compared with 10,131 tons during the same period of 1961.

During the month of September 1962, Greek shipowners bought in Germany three old steam-powered fishing trawlers, which they intend to convert into Diesel-powered freezer-trawlers. These vessels will increase the Greek Atlantic fleet to about 24 freezer trawlers. Included in that number is a 41.5-meter (136 feet) freezer-trawler under construction in a Greek shipyard.

The consumption of frozen fish for the whole of Greece during August 1962 amounted to 1,734 metric tons, as compared with 1,580 tons in July 1962. (Alieia, October 1962.)



Iceland

FISHERIES TRENDS, EARLY NOVEMBER 1962:

South Coast Herring "Share-of-the-Catch" Dispute: The settlement proposed by Icelandic Government mediators in the South Coast winter herring fishing contract dispute would give fishermen a share of the catch that was equal, or in some cases exceeded, the share received by fishermen in the summer herring fishery. The share of the catch in the proposed settlement would partly depend on the type of vessel and its equipment. Fishermen and motor boat owners finished voting on the proposed settlement November 7, 1962, but the results are not yet known. The Minister of Fisheries in a Parliament debate suggested Government intervention in the South Coast herring dispute in case there is no agreement between fishermen and motor boat owners.

British Trawler Fined: The skipper of a British trawler charged with operating within the Icelandic fishing limits zone was

fined 230,000 kronur (US\$5,341) and his catch and fishing gear were confiscated, according to the Icelandic press. (United States Embassy, Reykjavik, November 9, 1962.)

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FISHERIES TRENDS, MID-NOVEMBER 1962:

South Coast Herring "Share-of-the-Catch" Dispute: Boat owners and fishermen overwhelmingly rejected the settlement proposed by Icelandic Government mediators in the South Coast winter herring fishing contract dispute. Motor boat owners in Akranes have made a separate settlement with the local herring fishermen which is more advantageous to the fishermen than the State proposal.

License to Use U. S. Process in Freezing Fish Fillets: The Federation of Icelandic Co-operative Societies got a license on November 8, 1962, from a fishery firm in Gloucester, Mass., to use a United States patented process which slows escape of juices (drip) from fillets both before freezing and after defrosting. The process will be used on about 16 percent of Iceland's frozen fish. (United States Embassy, Reykjavik, November 16, 1962.)

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EXPORTS OF FISHERY PRODUCTS, JANUARY-OCTOBER 1962:

During January-October 1962, there was a considerable increase in exports of frozen herring, frozen fish fillets, salted herring, herring oil, and herring meal as compared with the same period in 1961, ac-

Product	Jan.-Oct. 1962			Jan.-Oct. 1961		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
		Metric Tons	1,000 US\$		Metric Tons	1,000 US\$
Salted fish, dried	1,938	38,111	884	3,069	57,674	1,511
Salted fish, uncured	24,982	302,598	7,020	25,174	251,157	6,580
Wings, salted	983	11,271	261	1,250	11,517	302
Stockfish	6,550	167,751	3,892	7,156	167,773	4,396
Herring on ice	4,899	17,144	398	3,754	9,630	252
Other fish on ice	26,943	84,915	1,970	20,562	95,983	2,499
Herring, frozen	17,076	93,552	2,170	10,069	48,151	1,262
Other frozen fish, whole	1,134	15,344	356	1,460	15,871	418
Frozen fish fillets	40,322	703,639	16,324	29,827	458,430	12,011
Shrimp and lobster, frozen	328	32,591	756	354	27,114	710
Roes, frozen	648	12,401	288	516	6,817	179
Canned fish	222	11,235	261	183	11,619	304
Cod-liver oil	3,751	30,459	707	3,350	28,737	753
Lumpfish roes, salted	401	6,156	143	476	8,068	211
Other roes for food, salted	2,745	37,922	880	2,468	24,897	652
Roes for bait, salted	1,387	8,678	201	1,348	8,131	213
Herring, salted	28,999	256,601	5,953	19,266	173,056	4,534
Herring oil	33,294	141,245	3,277	11,006	65,293	1,711
Ocean perch oil	15	59	14	460	607	15
Whale oil	1,152	9,104	211	917	6,452	169
Fish meal	19,334	121,130	2,810	26,694	106,994	2,803
Herring meal	37,230	243,555	5,650	23,260	116,927	3,063
Ocean perch meal	34	204	5	3,581	16,170	424
Wastes of fish, frozen	4,544	11,457	266	9,794	17,773	466
Liver meal	305	2,029	47	315	1,822	48
Lobster and shrimp meal	13	42	1	318	755	20
Whale meal	402	2,151	50	1,342	4,955	130
Whale meat, frozen	1,621	12,284	285	1,188	8,314	218

Note: Values converted at rate of 1 kronur equals 2.32 U. S. cents in 1962 and 2.62 U. S. cents in 1961.

Iceland (Contd.):



cording to the Statistical Bureau of Iceland's Statistical Bulletin, October 1962. Exports of fish meal, ocean perch meal, frozen fish waste, lobster and shrimp meal, whale meal, and dried salted fish showed a considerable decrease in the first ten months of 1962.

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FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-JUNE 1962:

Species	January-June	
	1962	1961
	... (Metric Tons) ...	
Cod	148,521	153,443
Haddock	15,977	16,778
Saithe	5,986	5,239
Ling	4,195	3,638
Wolffish (catfish)	9,910	8,901
Cusk	3,599	3,507
Ocean perch	2,962	10,640
Halibut	649	761
Herring	99,285	58,390
Shrimp	349	430
Other	3,331	3,595
Total	294,764	265,322

Note: Except for herring which are landed round, all fish are drawn weight.

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FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-JULY 1962:

Species	January-July	
	1962	1961
	... (Metric Tons) ...	
Cod	157,276	162,968
Haddock	19,010	18,890
Saithe	6,644	5,954
Ling	4,392	3,749
Wolffish (catfish)	10,832	10,287
Cusk	3,646	3,558
Ocean perch	3,436	13,225
Halibut	821	962
Herring	244,231	177,864
Shrimp	349	430
Other	6,327	6,460
Total	456,964	404,347

Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-JUNE 1962:

How Utilized	January-June	
	1962	1961
	... (Metric Tons) ...	
Herring ^{1/} for:		
Oil and meal	72,577	28,657
Freezing	14,070	8,004
Salting	4,851	17,609
Fresh on ice	7,718	4,119
Canning	69	-
Groundfish ^{2/} for:		
Fresh on ice landed abroad	12,730	15,539
Freezing and filleting	82,007	87,908
Salting	62,143	55,458
Stockfish (dried unsalted)	31,004	41,082
Home consumption	5,319	3,997
Oil and meal	1,156	1,718
Shellfish for:		
Freezing: Lobster	771	801
Shrimp	263	304
Canning (shrimp)	86	126
Total production	294,764	265,322
1/Whole fish.		
2/Drawn fish.		

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UTILIZATION OF FISHERY LANDINGS, JANUARY-JULY 1962:

How Utilized	January-July	
	1962	1961
	... (Metric Tons) ...	
Herring ^{1/} for:		
Oil and meal	183,516	113,758
Freezing	16,104	9,445
Salting	36,603	50,542
Fresh on ice	7,718	4,119
Canning	289	-
Groundfish ^{2/} for:		
Fresh on ice landed abroad	13,475	16,312
Freezing and filleting	92,821	99,409
Salting	65,218	59,876
Stockfish (dried unsalted)	31,466	42,040
Home consumption	6,253	4,751
Oil and meal	1,463	2,378
Shellfish for:		
Freezing: Lobster	1,689	1,287
Shrimp	263	304
Canning (shrimp)	86	126
Total production	456,964	404,347
1/Whole fish.		
2/Drawn fish.		



India

FIRM SEEKS JOINT FISHING VENTURE WITH JAPANESE:

An India fishing firm is reported to have approached the Japanese Overseas Fisheries Cooperative Association (a government-sponsored organization) with an offer to establish a joint fishing venture with a Japanese firm. A representative of the India company was in Japan during November 1962 to conduct

India (Contd.):

negotiations for this purpose. Reportedly, the India company wants to conduct trawl fishing in cooperation with a Japanese firm to increase its fish production, which presently totals 128,000 metric tons per year. Fishing by the company is conducted within a distance of 25 kilometers (15 miles) from the Indian coast. (Shin Suisan Shimbun Sokuho, November 6, 1962.)



Ivory Coast

SECOND FISHING TRAWLER LAUNCHED:

A Franco-Ivoirien shipbuilding firm launched Ivory Coast's second locally built fishing trawler, the Mafou AN 483 on November 24, 1962. About 69 feet long with a beam of 14 feet and drawing 7½ feet, the vessel is of similar size to the Golitcha, launched in May 1962. Both vessels were designed and built by a Spanish master shipwright from Morocco with aid of 20 native apprentice shipwrights. Early in 1963, a third vessel will be launched, and the keel of a fourth vessel was laid in November 1962.

The construction of new vessels plus a developing fishing port, freezing plant, and cannery is indicative of intense activity in expansion of Ivoirien fishing industry. Beneficial to Ivory Coast is training afforded fledgling Ivoirien shipwrights. (United States Embassy, Abidjan, November 30, 1962.)



Japan

CANNED TUNA EXPORT REGULATIONS FOR 1963:

New regulations governing exports of canned tuna to the United States were announced on November 30, 1962, by the Japanese Ministry of International Trade and Industry (MITI). Under the new regulations, export quotas will be allocated on the basis of actual quantities of canned tuna exported during December 1, 1961, through November 30, 1962. Previously, quota allocations for canned tuna were determined on the basis of actual quantities exported during the period 1950-1955. Canned tuna exports for the period December 1, 1962, through November 30, 1963, will be approved in accordance with the following procedure:

I. Limits on Variety: Approval of canned tuna exports to the United States shall be limited to canned tuna in brine and to tuna specialty packs (excluding tuna packed in oil).

II. Canned Tuna in Brine: Total export quota of canned tuna in brine shall be fixed and the allocation of

that quota to exporters shall be computed under the following method: (A) Total export quota shall be computed on the basis of actual quantities of canned tuna in brine exported to the United States during December 1, 1961, through November 30, 1962. However, in allocating quotas, quantities of less than 10 cases shall be counted as 10 cases. (B) In the event that an exporter transfers his quota to another exporter, his quota shall be reduced by the amount that was transferred, and the recipient's quota shall be correspondingly increased. (C) Exporters applying for approval to export canned tuna in brine to the United States must submit either one of the following documents with their applications: (1) members of the Japan Canned Foods Exporters Association shall submit an export certificate issued by the Association; (2) other exporters shall submit proof of sales contract concluded with the Tokyo Canned Tuna Sales Company; members of the Japan Canned Foods Exporters Association may substitute, in lieu of the Exporters Association's export certificate, documentary proof of sales contract concluded with the Tokyo Tuna Sales Company until such time that the Association's "Regulations on quantities of canned tuna to be exported to the United States" are issued. (D) Authorization of export quotas under the new regulations shall be based on 48 No. 2 cans (U.S. No. 1/2 7-oz.) as the standard case. Conversion rates for canned tuna of other sizes shall be as follows:

Japanese Can Size	Equivalent U.S. Can Size	Conversion Factor
Tuna No. 1 can 24's	13-oz, 24's	0.94
Tuna No. 3 can 48's	3-1/4-oz, 48's	0.48
Tuna 2-kg. cans 6's	4-lb, 6's	1.16

III. Tuna Spread and Pet Food: Exporters applying for approval to export tuna spread and pet food to the United States must submit the following documents: (A) Tuna spread--authorized copy of inspection certificate issued by the Japan Canned Foods Inspection Association. (B) Pet food--certificate of inspection issued by the Ministry of Agriculture and Forestry.

IV. Other Canned Tuna Exports: Exporters applying for approval to export other canned tuna products to the United States must submit a certificate showing that the products are not subject to United States import duty (certificate issued either by the U. S. Government or by the Japan Canned Foods Exporters Association) and, in addition, a certificate issued by the Japan Canned Foods Inspection Association certifying compliance with the United States tariff requirements.

V. Country of Destination: The term "United States" as used in the regulation refers to the 50 states in the United States, the District of Columbia, Puerto Rico, Virgin Islands, Panama Canal Zone, Guam Island, American Samoa, Wake Island, Midway Island, Canton Island, Eniwetok Island (Phoenix Islands' group), and St. Thomas Island.

VI. Export Performance Report: With the exception of members of the Canned Foods Exporters Association, all exporters applying for approval to export canned tuna in brine to the United States during December 1, 1962, through November 30, 1963, must submit to MITI by December 20, 1962, previous export licenses (Customs Clearance Forms) covering the period December 1, 1961, through November 30, 1962, for certification of their export records. (Suisan Keizai Shimbun, December 1, 1962.)

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FROZEN TUNA EXPORTS TO UNITED STATES, APRIL-OCTOBER 1962:

Data compiled by the Japan Frozen Tuna Producers Association for frozen tuna approved for export to the United States from

Japan (Contd.):

Frozen Tuna Exports to U. S. Direct from Japan, April-October 1962 and 1961		
Product	1962	1961
	(Short Tons)	
Albacore:		
Round	13,363	12,710
Loin	106	524
Dressed	-	5
Yellowfin:		
Gilled & gutted:		
With head	22,465	16,512
Without head	350	320
Fillet	2,683	1,657
Loin	2,462	1,707
Big-eyed:		
Round	45	114
Gilled & gutted:		
With head	124	27
Without head	-	21
Fillet	25	321
Loin	357	55
Skipjack:		
Round	151	217
Loin	-	1
Fillet	-	5
Bluefin:		
Loin	41	6
Fillet	-	5

Japan proper during April-October 1962 are shown in the table. There is a balance of 5,809 short tons in the yellowfin tuna export quota available for export to the United States for the remainder of the current fiscal year. (Suisan Tsushin, November 2, 1962.)

FROZEN TUNA EXPORT TRENDS, EARLY NOVEMBER 1962:

Early in November 1962, the trend of Japanese exports of frozen tuna was causing concern to the industry in Japan due to the dull market abroad and the stagnancy in sales.

Tuna export prices as of early November 1962 to the United States were \$310 for albacore, \$270 for yellowfin, f.o.b. Japan. Those prices were substantially lower than those prevailing in April and May 1962 when they had reached a peak of \$430 for albacore and \$380 for yellowfin.

A marked drop in shipments of frozen tuna to the United States occurred beginning in September 1962. Taking exports of frozen yellowfin, for example, the Export Frozen Tuna Fisheries Association reported exports of 6,000 tons in April, 5,800 tons in May, 2,300 tons in June, 7,400 tons in July, 3,100 tons in August, 2,200 tons in September, and an estimated 2,000 tons in October.

(Translation from Japanese periodical Suisan Keizai Shimbun, November 10, 1962.)

BUYERS REQUEST POSTPONEMENT OF FROZEN ALBACORE TUNA SHIPMENTS FROM JAPAN:

As of the latter part of October 1962, Japanese shippers reported that the prices offered by buyers of frozen albacore tuna had been dropping ten dollars a short ton almost weekly. The last offer was US\$295 a short ton f.o.b. Japan as of the end of October 1962.

Due to the market situation in the United States, September-November shipments were postponed by many buyers. It was estimated that more than 2,500 tons of albacore remained unshipped as of mid-October 1962 because of requests by buyers to postpone shipment. (Japanese periodical, October 27, 1962.)

JAPANESE FIRM SEEKS PRIVATE U. S. CAPITAL TO BUILD TUNA VESSELS:

A Japanese firm is promoting a plan to construct tuna vessels of the 1,000-ton class with funds to be borrowed from a large United States fruit canner. Of the US\$1.1 million planned for the construction of the tuna vessels, the Japanese firm has almost reached an agreement to borrow \$750,000 from the large packer in California at an interest of slightly more than 5 percent a year. The plan was submitted to the Japanese Fisheries Agency early in November 1962.

The United States packer specializes in canning fruits, but recently entered into the field of tuna packing. The raw fish for the operation would be supplied by the planned 1,000-ton vessels which are expected to fish in the South Atlantic. (Translations from the Japanese periodicals Suisan Tsushin and Suisan Keizai Shimbun.)

FROZEN TUNA EXPORT QUOTAS FOR 1963:

The Japan Frozen Tuna Producers Association, which held a special meeting on November 28, 1962, to study the 1963 frozen tuna export quota from Japan proper to the United States, reportedly has adopted a proposal to increase the present frozen yellowfin tuna export quota (35,000 short tons) by 10,000 short tons and the present tuna loin export quota (5,000 short tons) by 1,000 short tons. The

Japan (Contd.):

increase of 10,000 tons for yellowfin tuna is to be allocated as follows: 8,000 tons to producers on the basis of past performance records; 1,970 tons unassigned (so-called free quota); and 30 tons to newly authorized exporters. The 1,000-ton increase for tuna loin exports is to be allocated as follows: 800 tons on the basis of past performance records; 195 tons unassigned; and 5 tons to newly authorized exporters. The new quotas are to become effective from December 19, 1962.

At the same meeting, the Association also agreed to request the Fisheries Agency to designate Philipsburg, Saint Martin Island, Dutch West Indies (due east of Puerto Rico) as a transshipment port. The port of Philipsburg can accommodate 2,000-ton (gross tons) vessels and, if approved by the Fisheries Agency, would become the nearest transshipment port to the United States for Japanese fishing vessels operating in the Atlantic Ocean.

Other designated transshipment ports in the Caribbean Sea area are Port-of-Spain (Trinidad Island), Willemstad (Curacao Island)^{1/}, and Cristobal (Panama). (Shin Suisan Shimbun Sokuho, November 29, 1962, and other sources.)

^{1/}Although Willemstad has been designated as a transshipment port by the Japanese Government, cold-storage facilities at that port are described to be inadequate and Japanese tuna vessels reportedly are not now using that port for transshipment purposes. Reportedly, Willemstad is expected to be used as a transshipment port as soon as adequate cold-storage facilities are built by a large Japanese fishery firm, which plans to construct a 1,000-ton capacity cold-storage plant, as well as a cannery, at that site. Available information indicates that the Japanese firm is experiencing difficulty in procuring necessary foreign exchange to proceed with its plans.

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FROZEN TUNA EXPORTS TO ITALY:

Japanese exports of frozen tuna to Italy had exceeded 22,000 metric tons during January-September 1962. (Ordinarily the exports consist of direct shipments and transshipments of tuna caught by Japanese vessels operating in the South Atlantic area.) It was expected that by the end of 1962 exports would reach a total of 33,000 tons. In the past, exports totaled 22,000 to 25,000 tons annually. In 1962 there was a resumption of shipments direct from Japanese ports--the annual total should be around 2,500 tons.

The Japanese late in October 1962 reported a comparatively firm tone for frozen tuna for export. The price of US\$375 c.& f. a metric ton was only about \$15 lower than the highest summer market price. (Japanese periodical, October 27, 1962.)

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FROZEN TUNA EXPORTS TO SPAIN AND PORTUGAL:

A Japanese press report dated December 10, 1962, states that the Japanese Fisheries Agency has decided to approve exports of frozen tuna to Spain and Portugal in view of the tremendous demand for tuna in those countries. This decision represents a reversal of the Agency's original policy of not approving frozen tuna exports to those countries for fear that the canned tuna they produced from Japanese-supplied raw materials would be exported to the United States, where they would enter into direct competition for the United States tuna market with Japanese canned tuna.

The Fisheries Agency reportedly is satisfied that economic conditions (high c.i.f. price) rule out this potential danger but is limiting such exports to those from Japan proper only. At the same time, the Fisheries Agency approved the landing of a maximum of 2,000 metric tons of frozen tuna at Las Palmas, Canary Islands (Spanish territory), for Japanese fiscal year 1963 (April 1963-March 1964) and 700 metric tons for the period to March 1963 for processing by local packers. In granting those landing quotas, the Fisheries Agency is requesting that canned tuna packed in the Canary Islands from raw tuna supplied by Japan should not be exported to the United States or shipped to Spain proper.

According to an earlier press report dated November 27, albacore landed in Spain at that time were bringing \$500-517 a metric ton, whereas, in 1961, the price was \$384-400 a metric ton. (Suisan Tsushin, November 27, and December 10, 1962.)

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EX-VESSEL TUNA PRICES AT TOKYO:

The following ex-vessel prices were paid on December 4, 1962, for 500 metric tons of tuna and other fish landed at the Tokyo Central Fish Market, according to a translation from the Japanese periodical Suisan Keizai Shimbun, December 6, 1962.

Japan (Contd.):

Product	Price	
	Yen/Kq.	\$/Short Ton
Yellowfin (gilled and gutted):		
Extra large (over 120 lbs.)	97-105	245-264
Large (100-120 lbs.)	112-113	282-285
Medium (80-100 lbs.)	116-117.4	292-296
Small (20-80 lbs.)	117-118.4	295-298
Albacore	121.3-126.3	306-319
Skipjack	40-41.5	101-105
Fillet:		
Yellowfin	132.3-139.1	334-350
Big-eyed	140.7-144	354-363
Bluefin	132.8-135	335-340

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CANNED TUNA IN BRINE EXPORTS TO UNITED STATES INCREASED:

The Japan Canned Foods Exporters Association held a meeting on November 16, 1962, to discuss the additional sale of canned tuna in brine for export to the United States since the Association's export quota (2,200,000 cases) established for the current year had already been filled. (Actual exports totaled 2,202,960 cases.) At the meeting, the Association members agreed to offer an additional 75,000 cases for sale. Shipments were expected to be completed by the end of November to ensure entry of the products into the United States before the end of the calendar year. (*Nihon Suisan Shimbun*, November 21; *Suisan Tsushin*, October 16, 1962.)

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EXPORTS OF CANNED TUNA IN OIL AND SPECIALTY PACKS:

Data compiled by the Japan Export Tuna Packers Association reveal that canned tuna in oil approved for export from Japan during April-October 1962 totaled 777,230 cases. This was a 10-percent decrease from April-October 1961 exports (which totaled 846,077 cases) and a 40-percent increase over the same period in 1960 (when exports totaled 552,086 cases).

Exports of canned tuna specialty packs totaled 263,776 cases April-October 1962, showing more than a twofold increase over the same period in 1961, when exports totaled 127,589 cases. By kind, they were as follows: 66,526 cases of jelly tuna; 88,565 cases of vegetable tuna; 6,069 cases of tuna in tomato sauce; and 2,616 cases of other packs. (*Suisan Tsushin*, November 30, 1962.)

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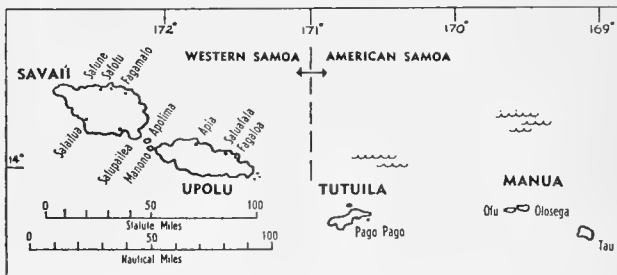
CANNED TUNA INDUSTRY REPRESENTATIVES TOUR U. S.:

A party of four Japanese representatives of the tuna-tangerine packing industry left Japan on November 28, 1962, for a two-week tour of the United States to study United States market conditions. They were: Isokichi Goto, Executive Director, Japan Tangerine Packers Association; Komazo Yoshida, Chief, Marine Products Division, Tokyo Shokuhin; Yoichi Sakurada, President, Sakurada Industries; and Seiichi Shibano, President, Shimizu Suisan Kaisha. The Japanese visitors were scheduled to arrive in Los Angeles on December 6, 1962, and were to spend one day in the Los Angeles area. (*Suisan Keizai Shimbun*, November 29, 1962, and other sources.)

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AMERICAN SAMOA TUNA PRODUCTION QUOTA FOR JAPANESE VESSELS:

Following the announcement by a large United States packer of a plan to construct a cannery in American Samoa, several Japanese fishing firms are said to have unofficially approached



the Fisheries Agency concerning the allocation of a new production quota for that area. Reportedly, such a quota, if granted, is very likely to be allocated to two Japanese groups. The Fisheries Agency is said to be considering an additional production quota of around 6,000 short tons for American Samoa. Present production quota for Japanese tuna fishing vessels delivering their catches to American Samoa is 18,000 short tons of tuna. (*Suisan Tsushin*, November 21, 1962.)

Editor's Note: Another United States tuna packer already has a cannery in American Samoa and the quota of 18,000 tons is for that cannery.

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Japan (Contd.):

HOOK-AND-LINE SKIPJACK TUNA FISHERY TRENDS:

The Japanese hook-and-line fishery for skipjack tuna off Kinkazan, Miyagi Prefecture, began in mid-June 1962. Early in November 1962, the season was near the end as some vessels had already left the fishing grounds. Local hook-and-line vessels and those from Kochi, Mie, and Shizuoka Prefectures were expected to wind up the season after two more fishing trips. Compared with 1961 when catches were good and prices high, landings in 1962 were light and prices low. All the vessels were looking forward to more profitable fishing in southern Pacific areas.

The vessel operators commented that they had difficulties with high-priced sardine for bait in 1962 with prices at \$3.89-\$4.72 per bucket as of the end of October. It takes US\$1,111 to provide bait for one fishing trip. Adding the cost of ice and other items, expenses for a trip were \$2,222. Operating costs are considered too high for a profitable operation.

A skipjack hook-and-line vessel that landed its catch at Shiogama planned to fish in waters around the Marshall Islands after making 2 local trips and completing 3 fishing trips off the Bonin Islands. The vessel then planned to return to fishing off the San-riku coast. The fishermen are seriously concerned about the problem of obtaining bait and they are of the opinion that fishing cannot be profitable until the high cost of bait is solved. (Suisan Keizai Shimbun, November 9, 1962.)

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VESSELS USE HOOK AND LINE TO FISH TUNA OFF AFRICA WEST COAST:

Since June 1962, a Japanese firm has been fishing tuna with hook and line in the inshore waters off the southwest coast of Africa. Good fishing was reported attracting the attention of the industry in Japan. This is the first time the Japanese have used hook and line to fish tuna off Africa.

The hook-and-line method is used by the company's four tuna vessels, the Kuroshio Maru No. 70, No. 71, No. 72, and No. 73, all 230-ton class vessels. They were specially designed to fish hook and line and long line concurrently. This is the first attempt by

the Japanese to design a vessel that could use both methods of fishing.

As of early November 1962, Tima and Freetown in Ghana were used as bases. The tuna catch consisted of yellowfin weighing 61 pounds each, small yellowfin weighing 17 pounds each, and skipjack weighing 7 pounds each. Compared with tuna long-line vessels operating in the Atlantic, they are getting surprisingly larger catches. On each vessel there are three natives in addition to 23 Japanese crew members. Fishing trips last 15-20 days. Live sardine are used for bait. Bait is abundant along the coast and this helps in catching 100 tons per fishing trip.

The fishing method used is based on studies carried out since 1960 by two technicians of the Japanese company. The vessel used was designed to fish hook and line concurrently with long line. With the Kuroshio Maru No. 70 completed in February 1962 as the first one, four vessels of the same type were built at the Hakodate Shipyards. Early in November the fifth vessel, the Kuroshio Maru No. 75, sailed from Kurihama for the African coast.

The characteristics of the vessel are (1) the position of the platform for hook and line, (2) mechanized handling of catch, (3) holding facilities for live bait, (4) ability to catch and replenishing live bait supply (two powered catchers on board are capable of operating surrounding and dip nets), and (5) equipped also for tuna long-line fishing. (Translation from Japanese periodical, November 10, 1962.)

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FIRM'S TUNA MOTHERSHIP FLEET DEPARTS FOR SOUTH PACIFIC:

A large Japanese fishing company's tuna mothership Tenyo Maru (3,750 gross tons), accompanied by a fleet of 50 catcher vessels, was scheduled to depart Japan for the South Pacific Ocean on December 3, 1962, on a 117-day fishing trip. It was scheduled to return to Japan toward the end of April 1963. The mothership's catch target is 5,000 metric tons of tuna and other fish. (Suisan Tsushin, November 20, 1962.)

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TUNA VESSEL OPERATIONS IN ATLANTIC OCEAN, EARLY NOVEMBER 1962:

In October 1962, there were 77 Japanese tuna long-liners fishing in the Atlantic Ocean--

Japan (Contd.):

this was the greatest number to operate in that area since tuna fishing was started by the Japanese in the Atlantic. But in November it was expected that there would be 79 long-liners in the Atlantic. In November 1961, there were only 52 vessels. Most of the fleet was fishing albacore tuna off Angola. Fishing continued good and the catch consisted of 60-70 percent albacore.

Although exports of frozen albacore to the United States had dropped off, exports to France were increasing rapidly. But as of early November, there was only a small balance left in the quota allocated for France. (Suisan Tsushin, November 10, 1962.)

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INDIAN OCEAN TUNA FISHING REPORTED POOR:

A Japanese fishing firm's Class II portable-vessel-carrying tuna mothership^{1/} Ban-shu Maru No. 5 (3,700 gross tons), which commenced fishing in the Indian Ocean in the vicinity of the Seychelles Island from October 16, was reported to have encountered poor fishing mid-October to mid-November 1962. Her eight portable catcher vessels in one month reportedly caught an average of 1.5 metric tons of fish a day per vessel, totaling 12 tons a day, which is far below the anticipated daily catch target of 20 tons. To seek

Composition of Catch by Japanese Tuna Mothership, Mid-October to Mid-November 1962	
Species	Catch
	Metric Tons
Yellowfin tuna	128.8
Albacore tuna	1.6
Big-eyed tuna	60.4
Spearfish	33.1
Shark, etc.	22.1
Total catch	246.0

better fishing, the vessel was reported to have made a four-day run, beginning November 16, to the fishing grounds off Mombasa, Kenya.

As of November 16, the vessel had landed a total of 246 tons of tuna and other fish (Suisan Tsushin, November 20, 1962.)

^{1/}Under the revised mothership regulations, Class II portable-vessel-carrying tuna motherships (over 2,000 gross tons) are not permitted to engage directly in fishing and can employ only portable vessels to do the actual fishing.

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TUNA RESEARCH COUNCIL MEETS:

The All Japan Skipjack and Tuna Research Council met in Tokyo in November 1962 and determined its work plan. The council is going to emphasize research on (1) mechanization and automation of fishing techniques, and (2) tagging studies and development of new bait fish.

In February 1962, the council backed several types of tuna research in process or planned. Included among these was research on the development of a fish finder for "use in the study of the ecology of tuna, research on the operation of long-line gear in sea water, and the vertical distribution of tuna species with use of a fish finder." Now reportedly an interim report on the subject has been published and it is said that the data have been obtained with use of an extra high-frequency fish finder. On the depth of long-line gear in sea water, the data obtained have checked out with those obtained by actual survey with the use of depth indicators. The practical use of a fish finder for determining the depth at which tuna long lines fish may be possible. (Japanese fishery periodical, November 17, 1962.)

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ESTABLISHMENT OF CENTRAL TUNA COOPERATIVE PROPOSED:

The Japanese National Federation of Fishery Cooperatives (ZENGYOREN) scheduled a meeting for November 30, 1962, to discuss the establishment of a central tuna cooperative, called Katsuo Maguro Chuo Kosha. The central tuna cooperative is to be made up of members of the regional cooperatives who were granted special tuna vessel licenses under the Japanese Government's plan to assist the depressed coastal fishery. ZENGYOREN hoped to develop at the meeting articles of association, business plans, and other details. Affected by this plan are 30 medium-class (40-100 tons gross) tuna vessels.

The Fisheries Agency is reported to be actively supporting the idea of centralized management of the newly-licensed tuna vessels, as proposed by ZENGYOREN. The Agency is also reported to be planning on giving priority in allocating tuna production quotas to owners whose vessels were withdrawn from the depressed fisheries, such as the coastal, trawl, and surrounding-net fisheries and who were granted special tuna vessel licenses. This has stirred interest among large fishing companies to offer fishing contracts to those vessel owners.

On November 19, the Fisheries Agency met with prefectural government fishery representatives to study the operational plans of vessel owners in the coastal prefectures who were granted medium-class tuna vessel licenses under the Government's plan to aid the depressed fisheries. It was disclosed at that meeting that there were some discrepancies in the ZENGYOREN data made available to the meeting and the data submitted by the prefectural government representatives. ZENGYOREN's data showed that owners of eight newly-licensed tuna vessels who originally had engaged in the coastal fishery had indicated their intentions of joining the central tuna cooperative, whereas

Japan (Contd.):

the prefectural government representatives' data showed that, as of November 19, only three such vessel owners had announced their intentions of joining the central co-operative. This discrepancy was attributed in part to the lack of recent and full communication between the prefectural governments and prefectural cooperatives. (*Nihon Keizai Shimbun*, November 4; *Suisan Tsushin*, November 14 & 21, 1962.)

Editors's Note: According to earlier press reports, the Fisheries Agency in August 1962 authorized, over a two-year span, the construction of new medium-class (40-100 tons) tuna vessels (20,000 gross tons) as replacements for fishing vessels to be withdrawn from the depressed fisheries. The new tuna vessel construction was allotted to the fisheries as follows: salmon fishery 10,500 gross tons, coastal 3,000 tons, trawl 3,000 tons, surrounding net 1,500 tons, and tuna 2,000 tons (to be allocated to tuna vessel owners who are planning to construct vessels larger than 99 tons gross).

Apparently, under the plan, coastal fishing vessel operators are building thirty 100-ton tuna vessels and surrounding-net fishing vessel operators are constructing 15 vessels of the same size.

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EXPORTS OF TUNA VESSELS:

The Japanese periodical *Suisan Tsushin*, December 7, 1962, reports that, following negotiations between the Governments of Japan and South Korea, the Japanese Government appears to have decided to approve the export of 15 additional tuna vessels to South Korea. These 15 vessels are in addition to the five 135-ton tuna vessels earlier approved for export (as freezer carriers) to South Korea by the Japanese Government. Reportedly, part of the funds for the construction of the 15 vessels is being supplied by a large United States tuna canner and by Japanese trading firms, and the majority of the vessels, when completed, are expected to be based at American Samoa.

The periodical further states that the Government of Okinawa has indicated a strong desire to purchase, as well as charter, Japanese tuna vessels. Reportedly, the Japanese Government is expected to respond to the Okinawan request but would likely restrict the export and charter of tuna vessels to a maximum of 2,350 tons in vessel tonnage, and the Okinawan Government is expected to issue formally vessel import licenses in the near future, according to reports. Vessels to be transferred to Okinawa reportedly would be made up wholly of old Japanese tuna vessels retired from the Japanese tuna fishery.

In addition to South Korea and Okinawa, Southeast Asian nations, like Formosa and Ceylon, are said to want to purchase Japa-

nese tuna vessels, and those nations are reported to be taking active measures through Government channels to negotiate those purchases.

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DISTANT-WATER TRAWL FISHERY:

There are as of October 1962 seven Japanese trawl fishing firms operating a total of 31 distant-water trawlers, the Japanese periodical *Minato Shimbun* of November 1 reports. The annual production of the overseas trawlers is reported to be 80,000 metric tons of frozen fish. The Japanese distant-water trawl operators will soon complete their first trawler construction program and will embark on a second trawler construction program for FY 1963 (April 1963-March 1964). The construction of additional trawlers will increase the trawler fleet to 41 vessels, totaling 70,000 gross tons. It is estimated that this fleet expansion will increase the annual fish production of the distant-water trawl fishery to more than 130,000 metric tons. Since the existing trawl fishing grounds would not be able to accommodate all of those vessels, new fishing grounds would have to be sought, and moreover, the fleets themselves may have to process their catches. Reportedly, the trawlers planned for construction under the second vessel construction program will be 2,500 gross tons or larger in size and will be equipped with fillet machines and fish meal plants. In order to expand the Japanese distant-water trawl fishery in the future, the trawlers will have to be capable of processing their catches for the production of fillets and fish meal at sea.



Fig. 1 - Typical Japanese trawler operating together with a mother-ship in North Pacific.

Since trawl fishing is conducted in distant international waters, cooperation among the fishing firms as well as assistance of the Government are desirable. Trawl fishing grounds off the western and southern coasts of Africa are the dollar-earning fishing areas for Japan. More than 10 large Japanese trawlers are operating regularly in those waters which abound in commercially-valuable fish. Japanese fishing firms are expanding their trawl fleets because they see trawling as the only fishery which can still be expanded. They are now extending trawl fishing to the north-west Atlantic Ocean, which is considered to be one of the world's three major fishing grounds. Japanese operations in that area are favored by the fact that the catches of cod and other groundfish can be exported directly to the United States and to European countries, thus earning foreign currencies for Japan. Needless to say, such exports are in accord with Japan's policy of promoting and expanding her foreign trade.

Fishing in distant waters presents various problems involving claims on territorial waters by foreign countries,

Japan (Contd.):



Fig. 2 - Catch of groundfish on the deck of a Japanese trawler fishing for bottom fish in the North Pacific.

fishery treaties, base operations, regulation of exports, and quality standards. The seven Japanese fishing firms engaged in the distant-water trawl fishery are reportedly planning to establish a distant-water trawl fishery association to deal with those problems as well as to prevent competition among themselves. The Fisheries Agency is said to be viewing this idea favorably.



Fig. 3 - Japanese factoryship operating in North Pacific waters. This factoryship was accompanied by 4 fishing trawlers.

Overseas trawl fishery forges ahead, opening up new fishing grounds for Japanese fishermen. Needless to say, this fishery must be firmly established with the support of the Government. It is reported that France is seeking Japanese cooperation and aid in developing the St. Pierre fishing port.

TRAWLING OPERATIONS IN NORTHWEST ATLANTIC:

A large Japanese fishing company is said to be planning on sending 2 or 3 large trawlers of the 3,500-ton class to the northwest Atlantic Ocean in 1963, one of which will be the Tenyo Maru No. 3 (3,800 gross tons). The Tenyo Maru is being used as a tuna mothership but is scheduled to be converted into a trawler upon her return from the South Pacific tuna fishing grounds in spring 1963.

The firm has not designated the names of the other trawlers it plans to send to the northwest Atlantic Ocean but is understood to be planning on constructing four large stern trawlers of over 2,600 gross tons. Catches are to be processed on board the trawlers and landed in Hamburg, Germany, for export to the United States, Canada, and the Common Market nations.

The first Japanese trawler to enter the Northwest Atlantic fishery belonged to another Japanese firm. The trawler, Aoi Maru No. 2 (1,386 gross tons), began fishing in the waters off the Newfoundland coast in mid-October 1962. It is reported to have experienced poor fishing. The Japanese Fisheries Agency attributed this to the lack of adequate investigations of the fishing grounds. (Shin Suisan Shimbun, December 3; Shin Suisan Shimbun Sokuho, December 5, 1962.)

TRAWLER FISHES IN NORTHWEST ATLANTIC FROM ST. PIERRE BASE:

The first Japanese trawler to operate in the Northwest Atlantic arrived at her new base in St. Pierre (French), off the coast of Newfoundland, early in October 1962. The vessel was the Aoi Maru No. 2 (1,138 gross tons) which sailed from Nagasaki early in August. Her first fishing trip from the St. Pierre base was expected to be about the middle of October--for cod principally, off Newfoundland and Greenland. During the winter months the vessel's area of operations was to be extended as far south as Florida for shrimp fishing.

Fishing operations of the Aoi Maru No. 2 are to continue until the end of 1963, with plans calling for six fishing trips before she returns to Japan in January 1964.

Japanese trawlers have not been entirely successful in fishing for groundfish in north Pacific waters, and Japan's fishing firms are now looking for more productive groundfish fishing areas. Results of the trawler's operations in the Northwest Atlantic will be closely observed by Japanese fishing interests.

The fishing firm operating the vessel is one of three firms which have applied for permits from the Japanese Fisheries Agency to fish in the Northwest Atlantic. (Japanese newspaper, October 26, 1962.)

Japan (Contd.):

TUNA VESSEL CONSTRUCTION:

The Japanese salmon fishermen engaged in the Japan Sea pink salmon fishery were excluded from among those granted special tuna licenses in August 1962 to construct the equivalent of 200 100-ton vessels (total vessel construction tonnage equal to 20,000 gross tons). Those fishermen have been asking for special tuna fishing licenses and are now demanding that they be permitted to construct at least 14 medium-class (40-100 tons gross) tuna vessels. The Japanese Fisheries Agency, which was reported to be considering licensing only about 7 tuna vessels, is expected to license less than 10 vessels to the pink salmon fishermen. (Suisan Tsushin, December 10, 1962.)

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TRAWL FLEET AND TRAWLER CONSTRUCTION:

Two large 2,500-ton trawlers are reported to have been ordered by a large Japanese fishing firm. Vessel construction was scheduled to begin the latter part of November 1962 for one vessel and in February 1963 for the other, with delivery scheduled for May and August 1963, respectively. Since 1960, this same firm has purchased six 2,500-ton trawlers (Amagi, Ibuki, Unzen, Hidehiko, Oe, Kaibun). These vessels have been assigned to the West African trawl fishing grounds together with two 1,000-ton trawlers, Asama Maru and Ikoma Maru. Upon completion of the two 2,500-ton trawlers, the firm will have a fleet of 12 trawlers over 1,000 gross tons.

Another Japanese fishing company's trawler fleet consists of two 1,800-ton trawlers and seven 1,500-ton trawlers. The addition of Taiyo Maru No. 73 (1,500 gross tons), which was scheduled for delivery in late November 1962, will increase the firm's fleet to 10 trawlers over 1,000 gross tons. Under the second trawler construction program, which begins in 1963, the firm plans to construct four 2,600- to 3,500-ton trawlers.

Besides the two firms indicated above, other fishing firms also operate large trawlers of more than 1,000 gross tons as follows: one firm--two 1,500-ton trawlers; another firm--two 1,500-ton trawlers; another--one 1,500-ton trawler; and still another--one 1,000-ton trawler. (Suisan Tsushin, November 2, 1962.)

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FISHERY CATCH OF IMPORTANCE TO CANNING INDUSTRY, 1957-1961; AND CANNED FISHERY PRODUCTS EXPORTS, 1961:

Salmon: Japan's most valuable canned fish export in 1961 was salmon. But Japanese exports of canned salmon in 1961 were down 42.4 percent in quantity and 35.3 percent in value from those in 1960 (see table 5). The Japanese catch of salmon has been declining since 1958 (see table 1). In 1962, the over-all Japanese fishing quota for salmon was reduced to 115,000 metric tons.

Table 1 - Japanese Catch of Salmon, by Species and Source of Catch, 1957-1961					
Source of Catch and Species	1961	1960	1959	1958	1957
..... (Metric Tons)					
<u>Motherships:</u>					
Red	34,901	28,047	18,463	24,248	42,564
Chum	13,013	20,584	23,787	35,918	21,726
Pink	4,908	2,459	25,252	22,091	34,681
Silver	647	2,387	3,215	9,203	934
King	105	499	200	157	95
Total from motherships	53,574	53,976	70,917	91,617	100,000
<u>Other Sources:</u> ^{1/}					
Pink salmon .	70,115	58,127	75,786	69,283	60,716
Other "	21,975	34,744	32,358	35,727	20,820
Total from other sources	92,090	92,871	108,144	105,010	81,536
Totalsalmon catch . . .	145,664	146,847	179,061	196,627	181,536
^{1/} Includes salmon from land-based gill-net vessels, long-line vessels, and coastal traps.					



Fig. 1 - A large catch of crabs on the deck of a Japanese crab factoryship in the North Pacific.

Tuna: In volume, tuna is Japan's leading canned fish export. Japanese exports of canned tuna in 1961 were up 9.4 percent in quantity and 21.2 percent in value from those of 1960. There was a modest upward trend in Japanese tuna landings in 1957-1960, due in large part to the development of a Japanese tuna fishery in the Atlantic Ocean. The catch of yellowfin tuna has shown a large increase, while the catch of other species of tuna has fluctuated.

Japan (Contd.):

Table 2 - Japanese Catch of Tuna, by Species and Source of Catch, 1957-1961 and January-September 1962

Source of Catch and Species	Jan.-Sept. 1962	1961	1960	1959	1958	1957
	(Metric Tons)					
Motherships:						
Bluefin			594	6,595	4	5
Albacore			7,971	5,554	4,096	3,125
Big-eyed			1,709	1,364	1,910	1,854
Yellowfin			8,587	2,920	4,656	5,153
Skipjack			60	77	41	42
Total mothership catch	1/	1/	18,921	16,510	10,707	10,179
Atlantic:						
Bluefin			684	256	34	63
Albacore			8,516	3,614	1,992	860
Big-eyed			2,801	1,478	453	454
Yellowfin			57,756	44,071	27,159	13,198
Skipjack			1	-	-	3
Total catch from Atlantic	1/	1/	69,758	49,419	29,638	14,578
Overseas Bases Other Than Atlantic:						
Bluefin			8	22	-	-
Albacore			11,897	12,029	10,760	5,625
Big-eyed			862	726	567	500
Yellowfin			2,592	2,542	2,986	1,551
Skipjack			-	-	3	-
Total catch from bases other than Atlantic	1/	1/	15,359	15,319	14,316	7,676
Other Sources:						
Bluefin	42,979	49,151	64,449	44,202	21,092	34,166
Albacore	51,189	43,138	60,721	46,971	46,327	68,111
Big-eyed	50,327	76,775	67,124	70,604	70,048	57,495
Yellowfin	63,848	63,375	85,085	76,866	76,735	79,613
Skipjack	68,262	124,217	78,546	166,628	147,388	97,418
Total catch from other sources	276,605	356,656	355,925	405,271	361,590	336,803
Total Catch by Species:						
Bluefin			65,735	51,075	21,130	34,234
Albacore			89,105	68,168	63,175	77,721
Big-eyed			72,496	74,172	72,978	60,303
Yellowfin			154,020	126,399	111,536	99,515
Skipjack			78,607	166,705	147,432	97,463
Total tuna catch	1/	1/	459,963	486,519	416,259	369,236

1/Data not available.

Note: Includes direct landings in foreign countries by Japanese fishing vessels. Does not include catch of tunalike fish.

Herring (or Herring-Like Fish) and Mackerel: Japan's exports of pilchards and anchovies in 1961 were down 57.0 percent in quantity and 55.2 percent in value from those in 1960. The over-all catch in Japan's fishery for "Iwashi" (sardine, anchovy, and pilchard) declined each year in 1957-1961. Japan cans sardines and small pilchards in cottonseed oil in dingley or quarter cans. They are marketed for domestic use only. The Japanese sardine pack in oil in quarter cans amounted to 18,000 cases in 1960 and 50,000 cases in

1961. Japan's exports of "sardines" consist of large pilchards and anchovies usually packed in tomato sauce. In 1961, the Japanese pilchard pack amounted to 622,300 cases of which 240,000 cases were packed in 15-ounce ovals (48 cans per case); 220,000 cases in 7½-ounce ovals (96 cans per case); 147,000 cases in 5-ounce flats (100 cans per case); 7,500 cases in 15-ounce talls (48 cans per case); and 7,800 cases in 8-ounce oblongs (96 cans per case). The entire pack of anchovies, which amounted to 4,500 cases, was packed in 7½-ounce ovals (96 cans per case).

Table 3 - Japanese Catch of Herring (or Herring-Like Fish) and Mackerels, 1957-1961 and January-September 1962

Species	Jan.-Sept. 1962	1961	1960	1959	1958	1957
	(Metric Tons)					
Herring (or Herring-Like Fish):						
Sardine	60,817	84,633	78,101	119,581	136,654	212,239
Round herring	36,709	19,307	48,877	47,067	56,544	52,815
Anchovy	246,404	258,369	349,175	356,232	417,281	430,211
Total Herring-like Fish	343,930	362,309	476,153	522,880	610,479	695,265
Mackerel:						
Horse mackerel and mackerel-scud	383,352	373,969	595,722	432,256	324,374	312,634
Mackerel	290,900	279,491	351,149	294,543	268,444	275,329
Mackerel-pike	90,153	108,930	287,071	522,566	575,087	421,530

Japan (Contd.):

Table 4 - Japanese Catch of Principal Shellfish Species of Importance to the Japanese Canning Industry, 1957-1961 and January-September 1962

Species	Jan. -Sept. 1962	1961	1960	1959	1958	1957
	(Metric Tons)					
King Crab:						
From motherhips	1/	1/	19,346	19,401	20,790	21,284
From other sources	3,734	4,501	5,985	8,052	7,427	4,605
Total king crab	1/	1/	25,331	27,453	28,217	25,889
Korean crab	1/	1/	13,413	10,900	11,062	9,626
Other crab	1/	1/	25,426	19,100	19,791	23,430
Total crab	1/	1/	64,170	57,453	59,070	58,945
Short-necked clams	85,544	95,385	102,491	84,261	85,145	86,933
Other clams	13,346	11,132	15,847	13,114	14,104	25,361
Oysters, shucked	1/	1/	25,977	24,555	20,051	18,649
Common squid	256,312	176,298	480,661	480,667	354,225	364,365
Cuttlefish	48,861	46,416	19,116	19,277	19,115	14,816

1/ Data not available.

Table 5 - Japanese Exports of Principal Canned Fishery Products, 1961

Product	1961		1960	
	Quantity	Value	Quantity	Value
	1,000 Cases	US\$ 1,000	1,000 Cases	US\$ 1,000
Salmon, trout	1,245	37,094	1,776	57,369
Tuna in oil	1,436	10,205	1,340	8,921
" " brine	2,207	19,181	2,034	16,397
Other tuna	62	370	12	59
Mackerel	938	3,501	497	1,628
Mackerel-pike	405	2,187	1,045	5,786
Pilchard and anchovy	313	2,450	715	5,475
Crab	496	11,856	520	11,659
Oyster	431	2,941	363	2,543
Other fish	1,093	9,249	834	6,387
Total	8,626	99,034	9,136	116,224

Note: Based on Japanese Customs statistics.

Japanese exports of mackerel in 1961 were up 88.3 percent in quantity and 115.0 percent in value from those in 1960. Exports of mackerel-pike in 1961 were down 61.2 percent in quantity and 62.2 percent in value from those in 1960. Japan's landings of mackerel-pike were down sharply in 1960 and 1961.



Fig. 2 - Removing shell from processed crab meat aboard a Japanese crab factoryship.

Shellfish: Crab and oysters are Japan's most important canned shellfish exports. Japanese landings of crab and oysters showed a modest upward trend in 1957-1960.

Note: See *Commercial Fisheries Review*, May 1962 p. 62, April 1962 p. 56, February 1962 p. 77.

* * * * *

JAPANESE AND UNITED STATES STEAMSHIP COMPANIES REACH AGREEMENT ON FREIGHT-POOLING SYSTEM:

At a meeting held in Tokyo, August 2-10, 1962, Japanese and United States representatives of the Japan-Atlantic and Gulf Freight Conference agreed to implement a freight-pooling system for the Japan-New York City service for a period of five years commencing October 1, 1962. Attending the meeting were representatives from nine Japanese companies and officials from three United States steamship companies. The operators agreed that, based on records for the past three years, Japanese operators will share 70 percent of the pool-freight earnings and United States operators 30 percent. Distribution of increased earnings during the five-year period will be the subject of discussion in subsequent meetings. Other members of the conference were invited to become participants in the system. The pooling arrangement was hailed by Japanese representatives as a united front to meet competition of non-conference members on the route and also to prevent excessive competition among Japanese lines. (Fisheries Attache, United States Embassy, Tokyo, August 24, 1962.)

* * * * *

Japan (Contd.):

KING CRAB FALL FISHING IN
EASTERN BERING SEA ENDS:

The Japanese Ishiyama Maru king crab mothership fleet (with 8 catcher vessels) left the eastern Bering Sea grounds early in November 1962 after attaining its production target of 400 metric tons of frozen crab meat. The Ishiyama Maru fleet (operated jointly by four Japanese firms) was one of two king crab mothership fleets issued licenses to operate in the eastern Bering Sea king crab fishery in the fall of 1962.

The other fleet, Shinyo Maru (with 4 catcher and 4 portable launch-type vessels), had left the fishing area earlier and had arrived in Japan in October 1962 with its production quota of 350 tons of frozen crab meat. The Shinyo Maru fleet also was operated jointly by four other Japanese firms.

The product consists of frozen "discs," described as crab meat which has been processed and prepared for immediate canning in shore canneries.

The Japanese fall king crab fishing in the eastern Bering Sea ended with the return of the Ishiyama Maru fleet to Japan. (Japanese newspaper, November 9, 1962.)

* * * * *

SHIPMENTS OF FROZEN OYSTERS
TO THE UNITED STATES UNDER NEW
U. S.-JAPANESE SHELLFISH
SANITATION AGREEMENT:

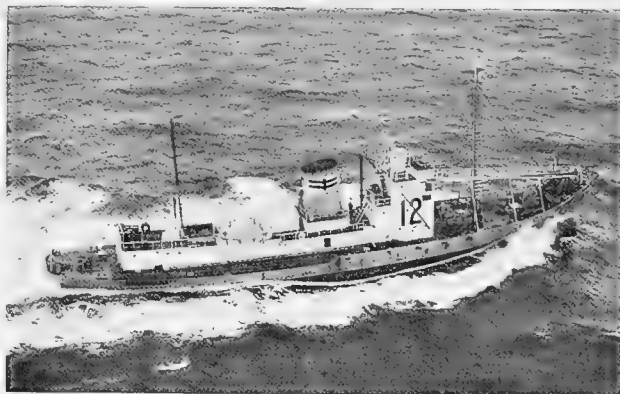
Initial exports to the United States under the new United States-Japanese Shellfish Sanitation Agreement have amounted to 50 metric tons of frozen shucked oysters at a reported price of about ¥520,000 (US\$1,437) per ton, c.i.f. United States. The frozen oyster shipment was packed in an oyster-freezing and canning plant in Hiroshima (opened in 1960) owned by a leading Japanese salmon-canning firm. The firm is the only Japanese company presently certified under the new Shellfish Sanitation Agreement and its officials expect to increase shipments of frozen oysters to the United States. (United States Embassy, Tokyo, November 16, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 77.

* * * * *

SPERM WHALE OIL PRODUCTION FOR
1962/63 SEASON REPORTED SOLD:

Although sales of baleen whale oil are poor, the Japanese whaling industry is enjoying a boom in sales of sperm whale oil. According to information from the Japan Aquatic Whale Oil Association, the entire output of sperm whale oil for the 1962/1963 factoryship season, estimated at 27,600 long tons, has been



Japanese whaling vessel in North Pacific waters.

sold through advance contracts to United States European, and domestic firms. About 60 percent (16,500 tons) of the estimated production will be delivered to the United States; 600 tons exported to the Netherlands; and 11,500 tons consigned to domestic dealers.

Contract prices for sperm whale oil to be delivered to United States firms are reported to be £86-88 (US\$240.80-246.40) a long ton as compared with £76-82 (US\$212.80-229.60) in 1961 (prices are c.i.f. New York City). Exports of sperm whale oil to the United States in 1961 amounted to 11,000 long tons. (Fisheries Attache, United States Embassy, Tokyo, August 24, 1962.)

**Mexico**WEST COAST SHRIMP FISHERY
TRENDS, OCTOBER-NOVEMBER 1962:

Shrimp vessels on Mexico's west coast were tied up for about two weeks and did not start fishing until about October 1. The 1961/62 west coast shrimp fishing season was originally scheduled to start on September 15, 1962, but was delayed because of a price dispute between the boat owners and cooperatives. At Mazatlan alone, the delay

Mexico (Contd.):

was estimated to have caused a loss of about 800 metric tons of shrimp valued at US\$1.5 million.

Shrimp landings and exports for Mexico's west coast were reported normal during October and continued about the same into November. Shrimplandings are generally at a peak during the four-month period October through January. Vessels operating out of Mazatlan during those months have landed an average of about 1,800 tons of shrimp with an ex-vessel value of from \$1.5 to \$1.8 million.

About 80 shrimp vessels were operating out of Mazatlan as of mid-November. Prior to October 1, 1962, some 240 shrimp vessels were privately owned and about 40 vessels were owned by the cooperatives. But because the new contract between boat owners and the cooperatives called for about 45 percent of the returns to go to the cooperatives, some of the boat owners were dissatisfied with those terms and this resulted in the sale of some 40 vessels to the cooperatives.

If shrimp fishing continues good, the individual boat owners stand to make money although not as much as they did before. It was reported that, if necessary, the Mexican Government is ready to give assistance to the individual boat owners so that they can operate profitably. (United States Consulate, Mazatlan, Mexico, November 15, 1962.)

* * * * *

CHANGES IN EXPORT DUTIES ON FRESH AND FROZEN FISHERY PRODUCTS:

With the exception of frozen shrimp, almost all frozen packaged fishery products were freed of Mexican ad valorem export duties effective November 27, 1962 (Diario Oficial, November 26, 1962). Before the change, Mexican ad valorem export duties on frozen packaged fishery products ranged from 3 to 12 percent.

Mexican export duties on fresh or iced fish and shellfish were also changed November 27, 1962. The new ad valorem export duties on fresh or iced shellfish are: 3 percent for oysters in shell; 5 percent for abalone (in shell or shucked), clams, crab, octopus, fresh-water shrimp; 10 percent for crustaceans not specified, and mollusks not specified.

The new export duty rates on fresh or iced fish range from 3 to 10 percent ad valorem. A rate of 8 percent ad valorem applies to fresh or iced red snapper, corvina, catfish, and tuna (other than skipjack and albacore). A rate of 5 percent ad valorem applies to most other fresh or iced fish including such species as flounder, mackerel, grouper, pompano, mullet, mojarra, drum, Spanish mackerel, and totuava. There are no specific duties for fresh or iced, and frozen and frozen packaged fish. Only ad-valorem duties are applied. (United States Embassy, Mexico City, November 28, 1962.)



Morocco

FROZEN SARDINE EXPORTS TO FRANCE ENCOUNTER TROUBLE AGAIN:

Dock workers at Lorient, France, refused to unload a shipment of frozen Moroccan sardines though frozen tuna was off-loaded from the same vessel. Agreement finally was reached, however, to permit the provisional storage of the sardines in port pending a final decision.

Moroccan sardine exports to France have been cut off since the violent protests staged by Breton fishermen in July 1962. It was believed that the current difficulties would be overcome in a manner which would permit a resumption of frozen sardine exports to France. (United States Embassy, Rabat, November 2, 1962.)



Netherlands

FOREIGN TRADE, PRODUCTION, AND SUPPLY OF FISH AND MARINE-ANIMAL OILS, JANUARY-JUNE 1962:

Supply and Distribution: The Netherlands supply of marine oils in January-June 1962 was mainly provided by stocks on hand January 1, 1962, and imports. Imports were almost six times greater than domestic production. In the first half of 1962, domestic use absorbed 63.1 percent of the marine oil supply, 7.6 percent was exported, and 29.3 percent was carried over on July 1, 1962.

Imports: The Netherlands imports of marine oils (mostly fish and whale oil) in January-June 1962 were down 15.8 percent in

Netherlands (Contd.):

Table 1 - Netherlands Imports of Fish and Marine-Animal Oils, January-June 1961-62						
Product and Origin	January-June 1962			January-June 1961		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		1,000 Guilders	US\$1,000		1,000 Guilders	US\$1,000
Fish Liver Oils:						
Belgium-Luxembourg	2	2	1	5	5	1
West Germany	206	106	29	201	133	37
Iceland	-	-	-	657	363	101
Norway	95	98	27	184	171	47
Japan	52	350	97	53	108	30
Other countries	99	58	16	8	7	2
Total fish-liver oils	454	614	170	1,108	787	218
Fish Oils:						
Belgium-Luxembourg	112	36	10	106	47	13
West Germany	837	336	93	847	463	128
Iceland	-	-	-	1,098	602	167
Angola	-	-	-	375	154	43
United States	9,215	3,675	1,019	4,021	2,252	624
Peru	7,554	3,071	852	9,280	5,127	1,422
Chile	3,500	1,232	342	-	-	-
Argentina	198	92	26	390	204	57
Other countries	537	193	53	546	266	74
Total fish oils	21,953	8,635	2,395	16,663	9,115	2,528
Whale Oil:						
Iceland	1,016	713	198	-	-	-
South-West Africa	-	-	-	410	322	89
Republic of South Africa	-	-	-	1,969	1,521	422
Chile	-	-	-	489	255	71
Japan	3,715	2,316	642	2,467	1,804	500
New Zealand	-	-	-	318	238	66
Landings from whaling factoryships	1,295	829	230	10,945	7,862	2,180
Other countries	20	14	4	88	54	15
Total whale oil	6,046	3,872	1,074	16,686	12,056	3,343
Other Marine Oils:						
Belgium-Luxembourg	-	-	-	2	2	1
Portugal	265	216	60	-	-	-
Peru	505	382	106	100	67	18
Chile	-	-	-	210	154	43
Japan	142	108	30	-	-	-
Landings from whaling factoryships	-	-	-	208	137	38
Other countries	146	122	34	69	52	14
Total other oils	1,058	828	230	589	412	114
Total fish and marine-animal oils	29,511	13,949	3,869	35,046	22,370	6,203

Note: Values converted at rate of 3.605 guilders equals US\$1.

Table 2 - Netherlands Exports of Fish and Marine-Animal Oils, January-June 1961-62						
Product and Destination	January-June 1962			January-June 1961		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		1,000 Guilders	US\$1,000		1,000 Guilders	US\$1,000
Fish-Liver Oils:						
Belgium-Luxembourg	18	14	4	14	15	4
West Germany	236	111	31	34	19	5
Other countries	11	14	4	5	6	2
Total fish-liver oils	265	139	39	53	40	11
Fish Oils:						
Belgium-Luxembourg	71	41	11	86	56	16
United Kingdom	-	-	-	747	434	120
West Germany	564	225	62	1,441	812	225
Sweden	98	49	14	-	-	-
Other	62	33	9	66	37	10
Total fish oils	795	348	96	2,340	1,339	371
Whale Oil:						
Belgium-Luxembourg	-	-	-	101	80	22
France	3,909	3,120	865	2,078	1,724	478
Italy	680	541	150	-	-	-
Other	103	54	15	110	86	24
Total whale oil	4,692	3,715	1,030	2,289	1,890	524
Other Marine Oils:						
West Germany	177	142	39	-	-	-
Other	-	-	-	6	6	2
Total other oils	177	142	39	6	6	2
Total fish and marine-animal oils	5,929	4,344	1,204	4,688	3,275	908

Netherlands (Contd.):

quantity and 37.6 percent in value from those in the same period of 1961. Whale oil imports were down 63.8 percent in quantity and 67.9 percent in value. Although fish oil imports were up 31.7 percent in quantity, their value was down 5.3 percent because of generally lower prices. The decline in whale oil imports was due mainly to a sharp drop in imports from whaling factoryships. The increase in fish oil imports (increase mainly from the United States and Chile) is explained by the decline in price, according to trade sources in the Netherlands, which report that fish oil is now widely used in the lower-priced margerines.



Exports: The Netherlands exports of marine oils (mainly whale oil) during the first half of 1962 were up 26.5 percent in quantity and 32.6 percent in value from those in the same period of 1961. Whale oil exports were up 105.0 percent in quantity and 96.6 percent in value. But fish oil exports were down 66.0 percent in quantity and 74.0 percent in value. France was the leading buyer of whale oil from the Netherlands in 1962, while West Germany was the leading buyer of fish oil and fish-liver oil. (Foreign Agri-

Table 3 - Netherlands Whale and Fish Oil Supply and Distribution, January-June 1962

Item	Whale Oil	Fish Oil	Total Marine Oil
	(Metric Tons)		
Supply:			
Opening stocks	25,000	11,425	36,425
Imports	6,046	1/24,052	30,098
Production	4,430	846	5,276
Total supply	35,476	36,323	71,799
Disposition:			
Exports	4,692	795	5,487
Domestic utilization	20,284	25,009	45,293
Total distribution	24,976	25,804	50,780
Closing stocks	10,500	10,519	21,019

1/Does not check with data in table 1. Probably includes a number of marine fats and oil categories not included in table 1.

cultural Service, United States Embassy, The Hague, October 22, 1962.)

Note: See Commercial Fisheries Review, September 1961 p. 94.



Nigeria

POLISH SCIENTIST APPOINTED BY FAO TO HEAD FISHERIES PROJECT:

To carry out a fisheries survey in the western region of Nigeria, the Food and Agriculture Organization (FAO) has appointed a Polish scientist. The scientist, who has a broad training in fisheries, will serve for the next four years as director of the United Nations Special Fund fisheries project. He was due to arrive in Lagos on November 23, 1962. At a later date he will settle in Ibadan where his duty station will be.



In 1956, a 20-foot aluminum surf boat was designed and built for the Federal Fisheries Department of Nigeria by a British shipyard. It was an experimental vessel designed for ring-net fishing. This shows the first trials of the boat and the rudder being placed in position.

Nigeria (Contd.):

From 1960 until his present FAO assignment, the Polish scientist was Scientific Director of the Sea Fisheries Institute of the Polish Ministry of Navigation at Gdynia. In addition he was, until September of 1961, head of the fish technology department of the Polytechnic University at Gdansk.

Before 1960 he was a professor at the Polish Academy of Sciences at Warsaw, where he lectured and worked on various fisheries research projects. He is the author of a number of scientific publications on fisheries subjects.



Norway

EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-JUNE 1962:

Smoked small sild sardines in oil was Norway's most important canned fish export in January-June 1962, accounting for 40.6 percent of the quantity and 34.6 percent of

Product	June			Jan.-June		
	Metric Tons	Kroner 1,000	US\$ 1,000	Metric Tons	Kroner 1,000	US\$ 1,000
Smoked brisling in oil	447	2,855	401	2,365	16,155	2,263
Smoked brisling in tomato	109	629	88	183	1,013	142
Smoked small sild in oil	886	3,739	524	6,104	25,946	3,633
Smoked small sild in tomato	234	834	117	605	2,189	306
Unsmoked small sild in oil	30	101	14	110	369	52
Unsmoked small sild in tomato	9	35	5	48	182	25
Kippered herring (Kippers)	273	1,115	156	2,495	10,831	1,517
Unsmoked herring in tomato	7	18	3	65	155	22
Mackerel	106	499	70	363	1,698	238
Roe unclassified	106	481	67	841	2,991	419
Soft herring roe	94	428	60	578	2,364	331
Fish balls	28	72	10	277	739	103
Other canned fish	8	52	7	62	433	61
Shellfish	191	2,156	302	931	9,973	1,397
Total	2,527	13,024	1,824	15,027	75,038	10,509

Country of Destination	June			Jan.-June		
	Metric Tons	Kroner 1,000	US\$ 1,000	Metric Tons	Kroner 1,000	US\$ 1,000
Finland	-	-	-	67	380	55
Sweden	60	310	43	183	831	116
Belgium-Luxembourg	94	440	62	359	1,678	235
Ireland	36	115	16	185	629	88
France	28	109	15	242	988	139
Netherlands	12	48	7	78	287	40
United Kingdom	847	3,894	545	2,775	11,440	1,602
West Germany	58	201	28	314	1,211	170
East Germany	-	-	-	616	2,098	294
Nigeria	20	70	10	30	105	15
South Africa Republic	92	377	53	459	1,846	273
Iraq	10	38	5	53	203	28
Canada	105	605	85	516	2,979	417
United States	703	3,638	510	7,217	36,778	5,151
Australia	206	833	117	853	3,421	479
New Zealand	21	79	11	64	260	36
Other Countries	72	250	35	476	1,673	234
Total ^{2/}	2,364	11,007	1,542	14,487	66,917	9,372

^{1/}Does not include exports of canned shellfish.

^{2/}Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: Norwegian kroner 7.14 equal US\$1.

the value of total exports of canned fishery products. Combined exports of smoked small sild sardines in oil, smoked brisling in oil, and kippered herring accounted for 73.0 percent of the quantity and 70.5 percent of the value of Norway's exports of canned fishery products in the first half of 1962.

Exports to the United States accounted for 49.8 percent of the quantity and 55.0 percent of the value of Norway's total exports of canned fish in the first half of 1962. The value of shipments to the United States was over three times greater than the value of shipment's to Norway's second most important customer, the United Kingdom. (Norwegian Cannery Export Journal, October 1962.)



Panama

SPINY LOBSTER EXPLORATORY FISHING PROJECT:

M/V "Pelican" Cruise 4 (August 30-September 7, 1962): A one-year exploratory survey for spiny lobsters along the Caribbean and Pacific coasts of Panama was started on August 27, 1962, when the M/V Pelican, a chartered commercial fishing vessel, arrived in Colon, Panama. The survey is being conducted by the U. S. Bureau of Commercial Fisheries through an interagency agreement with the U. S. Agency for International Development (AID) Mission to Panama as an Alliance for Progress program.



Fig. 1 - M/V Pelican, commercial fishing vessel under charter to U. S. Bureau of Commercial Fisheries for exploratory work off Panama.

The Pelican, which has been outfitted with specialized equipment for exploratory spiny lobster fishing, is a 72-foot steel hull shrimp vessel capable of 21 days of continuous operation, with accommodations for a 10-man

Panama (Contd.):

crew and staff. A 17-foot outboard-powered skiff is available for shoal-water work.



Fig. 2 - Fiberglass skiff, loaded with pots and buoys, used for shoal-water exploratory spiny lobster fishing off Panamanian coast.

The objective of Cruise 4 was to test the operational effectiveness of the electronic equipment and fishing gear. Tests were made in the Chiriqui Lagoon area on the northwestern coast of Panama. Six fishing stations were completed with 39 traps set for average periods of 48 hours. Twenty-four reed traps, 5 wire traps, and 10 wooden slat traps were used, weighted and buoyed in the conventional manner. Five traps were lost due to squalls and strong tides. The total catch was limited to a single lobster (*Panulirus argus*) and a few snapper and grouper. Gear modifications consisted of increasing the anchoring weights and using flag and radar buoys.



Fig. 3 - Setting a reed lobster pot (nasa) from the M/V *Pelican*. The hydraulic pot puller can be seen on the boom tip.

M/V "Pelican" Cruise 5 (September 17-28): During this cruise, trap fishing was continued in the San Blas Island area along the northeast coast. A total of 15 trap fishing stations were completed with 90 traps set for average periods of 77 hours. Thirty-seven wire traps, 27 wooden slat traps, and 26 reed traps were used with a variety of baits including shark, barracuda, dolphin, scrap fish, and canned petfood. The total spiny lobster catch consisted of 5 *Panulirus argus*, 4 in wire traps baited with shark meat, and one in a reed trap baited with scrap fish. Only one trap was lost due to tides, and three were considered "donated" to the local Indian fishermen. Two SCUBA diving stations were completed in the area in an attempt to locate spiny lobsters visually. The results were generally negative; only a few were observed. In the San Blas Island area small quantities of spiny lobsters are caught for local consumption by spearing at night within the reef areas.

Trawling Observations on the Caribbean Coast: During cruises 4 and 5, four-trawling stations using a 40-foot shrimp trawl were made in areas where depth-recorder readings indicated smooth bottom. Two tows in the Chiriqui Lagoon caught small numbers of white and brown shrimp (*Penaeus schmitti* and *P. brasiliensis*) but heavy concentrations of bottom debris created unusual trawling problems. Off Icacos Island in 30 fathoms a 1-hour and a 2-hour tow produced catches of 50 and 60 pounds of mixed brown and pink (*P. duorarum*) shrimp, averaging 26-30 count heads-off.

Future Work in Caribbean: Future cruises on the Caribbean coast will combine trap fishing with a thorough habitat reconnaissance. The spiny lobster is restricted to definite rough bottom and reef areas, and successful exploration of the lobsters will depend on knowledge of areas meeting the requirements. Cruises 6 and 7 were to be conducted on the Pacific Coast, in the Gulf of Panama and in the Pta. Burica-Parida Island area.

M/V "Pelican" Cruise 6 (October 10-20, 1962): Between October 10 and 20, fishing was conducted in two areas, directly off Panama City-Balboa, in depths of 3 to 10 fathoms; and at the northern end of the Perlas Islands, in 5 to 10 fathoms.

Off Panama City, 141 traps were fished a total of 17,338 trap-hours, yielding a catch of 166 spiny lobsters (*P. gracilis*), and 5 rock lobsters (*Scyllarides* sp.). At 12 sta-

Panama (Contd.):

tions, the traps fished for periods of 2 to 4 days caught 36 spiny lobsters. The remaining 12 stations were fished for intervals of 5 to 11 days, and caught 130 spiny lobsters. Highest catch in a single trap was 9 spiny lobsters. Only two traps were lost.

Off the Perlas Islands, 28 traps were fished for a total of 561 trap-hours, and produced one spiny lobster. Eight traps were lost due to strong currents.

Individual spiny lobsters ranged from 2 to 54 ounces and averages 20.2 ounces. The mature females (43 percent of the total) were either carrying eggs or had recently released them.

M/V "Pelican" Cruise 7 (October 30- November 16, 1962): Trap fishing was conducted off Punta Chame, in 5-13 fathoms; off Cabo Mala, in 12-15 fathoms, between Coiba Island and Jicaron Island, in 4-10 fathoms; at Montuoso Island, in 8-10 fathoms; and at the Belonos and Parida Islands, in 4-10 fathoms.

Off Punta Chame, 35 traps were fished for a total of 2,833 trap-hours with no lobster catch. An additional 25 traps were lost due to strong currents and shark damage.

At Cabo Mala, 17 traps were fished a total of 245 trap-hours with no lobster catch. Seven additional traps were lost because of strong currents.

North of Jicaron Island, 40 traps were fished a total of 4,172 trap-hours, and 19 *P. gracilis* and one *Scyllarides* sp. were caught. Two traps were lost from unknown causes.

At Montuoso Island, 12 traps were fished for 180 trap-hours with no lobsters produced and with no trap losses.

In the Parida Island area, the best fishing to date was experienced. Eighty-two traps were fished for a total of 3,785 trap hours. Total production was 79 *P. gracilis*. Trap-hours per lobster averaged about 48 compared to 104 hours per spiny lobster off Panama City (Balboa Point). The lobster averaged 19.3 ounces, and males outnumbered the females 2 to 1. The mature females were spawned out. Nine traps were lost from various causes.

The catch rate in the Prida-Belanos area, considering the exploratory nature of these first fishing trials, appears to offer some potential for commercial exploitation. Therefore, Pelican cruise 8 has been rescheduled to permit a more comprehensive evaluation of that area, and simulated commercial-scale production will be attempted.

Notes: (1) M/V Pelican cruises 1, 2, and 3 consisted of U. S. Bureau of Commercial Fisheries cruises off the southeast of the United States.

(2) See Commercial Fisheries Review, Sept. 1962 p. 100.



Peru

SUPPLY, EXPORTS, AND CONSUMPTION OF EDIBLE FISHERY PRODUCTS, 1960-1962:

Production of edible fishery products in Peru in 1961 was 8.3 percent greater than in



Fig. 1 - Typical procedure along the northern Peruvian and Ecuadorian coasts is to clean fish on the beach. This scene is at Mancora, Peru.



Fig. 2 - Cast netting at Puerto Pizarro. Catch by this type of gear used mainly for home consumption.

Peru (Contd.):

Peruvian Supply, Exports, and Consumption of Edible Fishery Products, 1960-1962							
Year	Supply			Exports	Total Apparent ^{1/} Consumption	Population of Peru as of June 30	Per Capita Consumption Pounds
	Production	Imports	Total Supply (Metric Tons)				
1962 ^{2/}	110,000	500	110,500	35,000	72,000	11,565,000	13.7
1961 ^{3/}	104,000	526	104,526	29,027	70,438	11,250,000	13.8
1960 ^{4/}	96,064	510	96,574	23,971	69,122	10,935,000	13.9

^{1/}Adjusted for changes in year-end inventories.

^{2/}Forecast.

^{3/}Preliminary.

Note: Data is for net weight of edible portion of fishery products.



Fig. 3 - Shrimp vessels beached at Puerto Pizarro. Vessels are brought to this shelter for cleaning and repairing.

1960. During the same period, exports of edible fishery products increased 21.1 percent, while total apparent consumption in Peru increased only 1.9 percent and per capita consumption declined slightly. (Foreign Agricultural Service, United States Embassy, Lima, October 8, 1962.)



Philippines

PLAN TO DEVELOP FISHERIES:

During the third quarter of 1962, Philippine officials announced new moves to



Fig. 1 - In 1959, under the guidance of an FAO expert from Japan, fishermen in the little village port of Mariveles, Bataan Province, are carrying sections of a nylon trammel net to the beach for assembling.

strengthen and promote the fishing industry. The plan, as announced by the Secretary of Commerce, aims at making fishing a major industry. In the past, it has provided only a small part of the consumption needs of the country, therefore raising the level of domestic fish production would make a major contribution to the government's socio-economic program and save needed foreign exchange.



Fig. 2 - FAO expert from Japan explaining the value of a nylon trammel net to fishermen assembled on the beach at Mariveles.

The plan would attack the major problems of the fishing industry: financing, lack of harbor facilities, inadequate refrigeration, and the high cost of marketing and operations. It also calls for the establishment of a fishermen's bank and cooperative fish canning factories. Apart from utilizing Japanese reparations there is no indication of how the plan is to be financed. (United States Embassy, Manila, November 19, 1962.)

* * * * *

Philippines (Contd.):

FISHING INDUSTRY DEVELOPMENTS:

About 60 percent of the 1961 fish production in the Philippines was of the sustenance type, followed by about 27 percent from commercial fishing vessels, and 13 percent from fish ponds, according to data furnished by the Philippine Bureau of Fisheries.

Despite increases in the Philippine gross annual fish production (454,890 metric tons in 1961 as compared with 362,927 tons in 1955), the net production deficiency of the Philippines appears to be rising. On the basis of per capita requirements of 26.97 kilograms (59.4 lbs.) of fish established by the National Research Food Council, production in 1961 fell short of requirements by 41.3 percent as compared with 39.9 percent in 1960. To meet requirements in 1961, a total of 74,630 metric tons were imported at a cost in foreign exchange of P34.63 million (about US\$12.6 million). Total available supply was about 529,530 metric tons, or a per capita consumption of about 20 kilograms (44 lbs.) for the year, or still short of the per capita requirements. Of total fish imports of P34.63 million in 1961, about 94 percent was in the form of canned fish (about 79.4 percent canned sardines mostly from the United States, Japan, and the Union of South Africa).

In 1961, more than 39 percent of the landings of commercial fishing vessels came from the Sulu Sea fishing grounds and about 25 percent from the Visayan Sea. Manila Bay yielded about 7 percent of the commercial landings.

There were in 1961 about 1,560 (over 3 gross tons) registered commercial fishing vessels, of which 1,309 were "powered" vessels. Most commercial fishing vessels (about 30 percent of the total number) are actually large motor bancas using Diesel outboard motors. Generally, these large motor bancas are each just a little over 3-gross tons. Close to 43 percent of the catches by commercial fishing vessels are made with the bag-net, and about 40 percent made with the otter trawl.

By the end of 1961, about 125,810 hectares (about 311,000 acres) of fish ponds yielded 60,824 metric tons of fish. About 125,810 persons were employed in fishpond operations. Estimated investments in fish

ponds reached P251.6 million (US\$91,490,900). In terms of area covered, most fish ponds in operation are leased from the Government (about 60 percent).

Most (about 65 percent) sustenance fishing is done by using fish corrals and filter nets, rather than by boat or vessels.

On August 28, 1962, the Secretary of Commerce announced that he had met with officials of the Inter-Island and Deep-Sea Fishing Association, the Chief of Harbor and Port Facilities of the Department of Public Works, and the Director of Fisheries. He announced that the meeting had developed a plan to raise the Philippine fishing industry to the level of a major Philippine industries. The success of the plan would depend upon the solution of problems of the industry: financing, lack of harbor facilities, inadequate refrigeration, and high cost of marketing and operations. As evolved at the meeting the plan envisages the following: establishment of a fishermen's bank; establishment of cooperative fish canning factories; utilization of loans from Japanese reparations; and assignment of an exclusive harbor with all facilities for fishing boats. (United States Embassy in Manila, September 13, 1962.)

Note: Values converted at rate of P2.75 equal US\$1



Rumania

JAPANESE TRAWLERS
TO BE PURCHASED:

A Rumanian firm is reported to have signed in late October 1962 a provisional contract with a Japanese shipbuilding company for the delivery of two factory trawlers, each of 3,800 gross tons. This is the first transaction involving vessel export from Japan to the Republic of Rumania. Further vessel exports to Rumania are anticipated since the Rumanian economic mission, which arrived in Japan in October, showed interest in purchasing additional Japanese vessels.

Reportedly, the purchase of the two factory trawlers was transacted at a total price of US\$5.8 million, payable in five years. The first trawler is scheduled to be delivered to the Rumanian firm in late 1963 and the second trawler in early 1964.

Specifications of the trawlers are as follows: over-all length, 278.8 feet; beam 51.2

Rumania (Contd.):

feet; speed, 13 knots. (Nihon Keizai Shimbun, October 27, 1962.)



Senegal

FISHERIES LANDINGS, 1959-1961:

Fisheries landings in Senegal in 1961 were 7.5 percent above those in 1960. In 1961, total landings of all species other than tuna were 11.1 percent greater than in the previous year, but tuna landings dropped 14.0 per-

Senegal Fisheries Landings, 1959-61			
Species	1961	1960	1959
Tuna ^{1/}	11,979	13,924	9,880
Other species ^{2/}	92,749	83,488	63,599
Total	104,728	97,412	73,479

1/Mainly landed by French vessels.

2/Mainly landed by Senegalese small vessels.

Note: Included are landings of frozen fish for re-export.



cent, according to the "Report on the First Year of Execution of the Four-Year Development Plan of Senegal, 1961-64" published by the Commissariat General au Plan of Senegal.



South Africa Republic

FISHERIES TRENDS, JANUARY-OCTOBER 1962:

Speaking at the third Harvest Festival of the Sea at Lambert's Bay, South Africa, on October 27, 1962, the South African Deputy Minister of Economic Affairs outlined current trends and plans for South Africa's fisheries as follows.

Total Exports: The annual value of South Africa's exports of fishery products has risen rapidly since 1945 and now exceeds R40 million (US\$55.8 million).



Fig. 1 - A spiny lobster vessel with a few of the crew members relaxing around one of the dinghies used to tend the lobster pots.

Pilchard-Maasbanker Fishery Landings and Exports: The catch of pilchards, maasbanker (jack mackerel), and mackerel in the January-July 1962 season amounted to a record 512,982 short tons, an increase of 3,500 tons over the catch in the same period of the previous year. (Editor's note: Adding the 1962 catch quota in South-West Africa of 435,000 tons, the total landings for the fishery was almost one million tons. In South-West Africa, the fishing season now lasts all year. In the South Africa Republic, the main fishing season, which ends July 31, is followed by a short season in November and December, when only maasbanker and mackerel may be caught. But the second season attracted little interest in 1961, when total landings in November and December amounted to only 2,502 tons.)

The increased capacity of South Africa's pilchard vessels has contributed to the heavy-

South Africa Republic (Contd.):

ier landings. In the 1962 season, 27 of the 126 licensed pilchard fishing vessels had hold space for over 100 short tons of fish, and 72 of the vessels could carry 80 tons or more.

The bulk of the pilchard-maasbanker catch is canned or processed into fish meal. About 15 percent of the total catch is canned and exported to 60 different countries where strong competition from Japan, the United States, and certain European countries is being successfully faced. The demand for South African fish meal is also good and the entire 1962 production has been sold.

Harbor Improvements: There is a great need for better fishing harbors along the long coast of South Africa. Expanded facilities for large vessels and fleets are needed. A total of R1,060,000 (US\$1,477,640) has been spent on improvements and extensions to the fish-harbor at Lambert's Bay. Between R7 mil-



Fig. 2 - A large otter trawler at the dock in Cape Town. The vessel is typical of the fleet that fishes for "stock-fish."

lion to 9 million (US\$9.8-12.5 million) is to be spent on fishing harbor improvements at Cape Town. But other harbors will be needed. The Director of Sea Fisheries is investigating the steps necessary for rapidly building fishing harbors. The Railways and Harbors Administration and the Fisheries Development Corporation are assisting in the study. The latter organization has appointed five engineers to help plan new harbors.

Tuna: Preliminary results from efforts to develop a commercial tuna fishery in Cape waters are promising. Two large South African pilchard vessels recently tried long-lining for tuna off the Eastern Cape. Experimental purse-seining for tuna is being spon-

sored by the Fisheries Development Corporation with the chartered vessel Thynnus. A large nylon purse-seine net was imported for use by the Thynnus. A South African Division of Sea Fisheries technologist who studied tuna purse-seine methods in the United States is giving valuable help to the Thynnus.

Fish Meal Venture in Chile: South African capital has been invested to build a fish meal factory in Chile. Engineers and building contractors from South Africa have gone to Chile to build the factory. Five vessel captains and their machinists have left South Africa for Chile to fish for the new factory. A South African engineering firm has received contracts worth R320,000 (US\$446,080) to manufacture machinery for the factory. The venture is in line with the recommendation of the Deputy Minister of Economic Affairs that South Africa expand its fishing industry to operate in distant-water fisheries. (South African Digest, November 1, 1962.)

Notes: (1) One South African rand equals US\$1,394.

(2) See Commercial Fisheries Review, October 1962 p. 66, September 1962 p. 101, and May 1962 p. 45 and p. 68.

* * * * *

CAPE TOWN BOATYARD BUILDS THIRTY FISHING VESSELS:

The year 1962 has been a very busy one for the largest builder of wooden fishing vessels in South Africa. By the end of 1962 the boatyard may have completed 30 vessels, more than double the number built in 1961. With their engines and other equipment, the vessels represent an investment of about R1,000,000 (US\$1.4 million).

Over a ten-year period to the end of 1961 this Cape Town yard has built more than 200 wooden vessels, about 175 of them longer than 50 feet and nearly all of them for the fishing industry of South and South-West Africa.

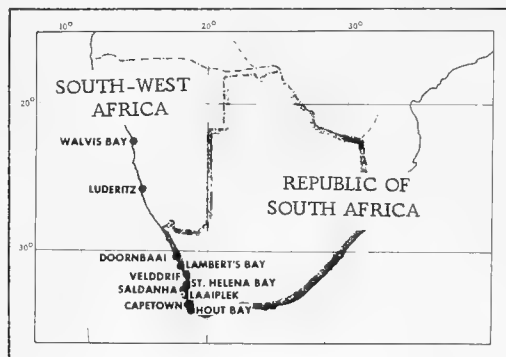
Of the 30 vessels built in 1962, 16 had been completed by early September, 14 more were due to be ready by the end of the year, and another 6 boats on order were due to be completed early in 1963. (The South African Shipping News and Fishing Industry Review, October 1962.)



South-West Africa

EIGHT SOUTH-WEST AFRICA VESSELS TO FISH FOR TUNA:

Eight fishing vessels from Walvis Bay, South-West Africa, at the end of the 1962 pilchard season planned to fish tuna off the Cape.



An interesting feature of the venture is the fact that a modified lampara seine net was to be used.

totalled 1,753 tons in July-August 1962) dropped 35 percent from the same period in 1961. Average ex-vessel prices for fish handled at the Vigo Fish Exchange May through August 1962 are shown in table 1.

The average ex-vessel price for the 4-month period in 1962 was 15.97 pesetas a kilo (12.1 U. S. cents a pound), an increase of 16.7 percent compared with the 13.68 pesetas (10.3 cents a pound) average for the same period in 1961.

Monthly landings at the port of La Coruna February through July 1962 were (in metric tons): February 2,419, March 2,649, April 3,485, May 5,260, June 10,359, July 12,488. The sharp increase in June and July was mainly due to seasonal cod landings after several weeks of fishing off Newfoundland. Retail prices of some representative species of fish in the La Coruna market are shown in table 2.

The shellfish season in the Vigo area started on October 1. Vigo Bay was crowded with hundreds of small rowboats, and thousands of men, women, and children picked clams and other mollusks during low tide. The same activity went on all along the Vigo coast.

It was reported that some vessels were fishing with the use of explosives (dynamite), and that the authorities were making efforts to stop that practice.

Fish Canning Industry: A wage agreement covering about 10,000 workers was signed by the fish canning industry in the Province of Pontevedra. Wage increases were 50 percent for men and 37 percent for women. A similar agreement was being studied for the Province of La Coruna.

Table 1 - Average Ex-Vessel Prices of all Fish at Vigo Fish Exchange, May-August 1962

Year	May		June		July		August	
	Pesetas/Kilo	US¢/Lb.	Pesetas/Kilo	US¢/Lb.	Pesetas/Kilo	US¢/Lb.	Pesetas/Kilo	US¢/Lb.
1962	9.25	7.0	10.75	8.1	14.41	10.9	13.51	10.2
1961	8.82	6.7	9.45	7.1	12.84	9.7	9.94	7.5

Table 2 - Retail Prices at La Coruna Market, May-August 1962

Species	May		June		July		August	
	Pesetas/Kilo	US¢/Lb.	Pesetas/Kilo	US¢/Lb.	Pesetas/Kilo	US¢/Lb.	Pesetas/Kilo	US¢/Lb.
Sardines	10.50	7.9	12.00	9.1	13.50	10.2	16.50	12.5
Horse mackerel . .	9.00	6.8	12.50	9.4	10.00	7.6	11.00	8.3
Hake, small . . .	32.50	24.6	35.00	26.5	40.00	30.2	50.00	37.8
Hake, large . . .	60.00	45.4	65.00	49.1	70.00	52.9	80.00	60.5

The vessels were to be based at Cape Town while fishing tuna off the Cape. They planned to return to Walvis Bay when the new pilchard season starts in February-March 1963. (South African Shipping News and Fishing Industry Review, October 1962.)



Spain

VIGO FISHERIES TRENDS, JULY-AUGUST 1962:

Fish Landings and Prices: Fish landings at the port of Vigo, Spain, in July 1962 totaled 8,158 metric tons and during August they were 7,501 tons, an increase of 11.4 percent compared with July 1961 and 2.1 percent more than in August the same year. Landings increased for horse mackerel, albacore tuna, octopus, mackerel, and small hake, but sardines (which

The fish canning industry is faced with higher production costs resulting from the wage increases. Also, prices are higher for both fish and olive oil. This brought about a general increase in canned fish prices which is bound to affect the export market. The domestic market in Spain was steady during the third quarter of 1962, with a good demand for most products, including sardines counting up to 25 fish in 1/4-club cans. The canned sardine pack was considered normal but the quality was only fair. Cannerys were obliged to take whatever raw fish they could get in order to meet expenses.

Peanut oil for canning fish may soon be authorized, it was reported. But the cannerys are somewhat reluctant to accept peanut oil as a substitute because the quality of their product has traditionally been based on the exclusive use of pure olive oil. Spain's importers of peanut oil have already approached the canned fish industry. The general feeling is that the acceptance of peanut oil by the canned fish industry is just a matter of time.



Tahiti

TUNA BASE PLAN:

A Japanese fishing company, a large United States tuna packer, and a French firm, which were reported in April 1962 to be planning on establishing a joint tuna base in French Tahiti, are said to have received definite assurance from the French Government in Paris that their joint venture would be approved. The Japanese firm is reported to have already submitted an application to the Fisheries Agency to engage in this joint enterprise.

According to plans, each participating firm will invest 1.8 million francs (US\$360,000), totaling 5.4 million francs (US\$1,080,000). Cold-storage facilities are to be constructed at Papeete for the handling and processing of frozen tuna, primarily for shipment to Japan and the United States. Facilities will include a 2,060-ton capacity cold-storage plant, including a sharp-freeze unit capable of handling 70 tons of fish daily, an ice-making unit capable of producing 50 tons of ice daily, and a 200-ton capacity ice storage plant.

The Japanese firm eventually hopes to contract 40 medium-class (40-100 tons gross) Japanese tuna fishing vessels to fish out of its Tahitian base. On the basis of 25 fishing vessels regularly operating out of the Tahitian base, the annual production of frozen tuna is expected to total 15,700 tons. (*Suisan Keizai Shimbun*, November 23, 1962.)

Editor's Note: This is one of two applications to set up a tuna base at Tahiti. The other application involves a Japanese trading firm and another United States tuna packer.



Taiwan

FISHERIES TRENDS, THIRD QUARTER 1962:

Tuna Industry: Taiwan's exports of frozen tuna in 1962 were expected to reach 2,800 metric tons, as compared with 1,000 tons in 1961. The United States receives most of Taiwan's exports of frozen tuna.

Delivery of 12 tuna long-line vessels being constructed locally with United States aid funds has been postponed until late December 1962 due to changes in the vessels'



Fig. 1 - A full view of Chung Hsin 33, a wooden otter trawler of the 135-ton class.

specifications. The specifications now call for 160- and 180-ton vessels equipped with freezing equipment. A loan program for vessel owners to add freezing equipment to tuna vessels of over 100 tons which fish for the export market has been arranged by the Taiwan Government. About 28 vessels can qualify for the loans.



Fig. 2 - Bonito caught in a purse seine. They will be scooped out. Note scoop net (far right) on long pole (far left).

The Taiwan Government's application to the International Development Association (IDA) for a loan to finance the construction of large tuna vessels is believed to be under active consideration. The Government requested a loan from IDA to build ten 300-ton, four 500-ton, and two 1,000-ton tuna vessels.

Trawl Fishery: An industry conference to review complaints and problems of the fisheries industry was convened in July 1962 by the Government's Agriculture Planning and Coordination Committee. The conference recommended that the construction

Taiwan (Contd.):



Fig. 3 - Fishermen unload their catch in the wharf at Nan Fang Ao, Taiwan.

of additional conventional trawlers be discouraged, but that midwater trawls and trawls with larger openings be tried. Since prices for trawl fish in the domestic market have been depressed by an oversupply, the Government is not encouraging the fishery. The



Fig. 4 - Pulling in the "bag" of a beach-seine net in which the catch is concentrated. This is a popular style of fishing in small communities of Taiwan.

conference recommended that work be done to promote the processing of fish as a means to help use surplus catch during the glut season and that marketing facilities be improved

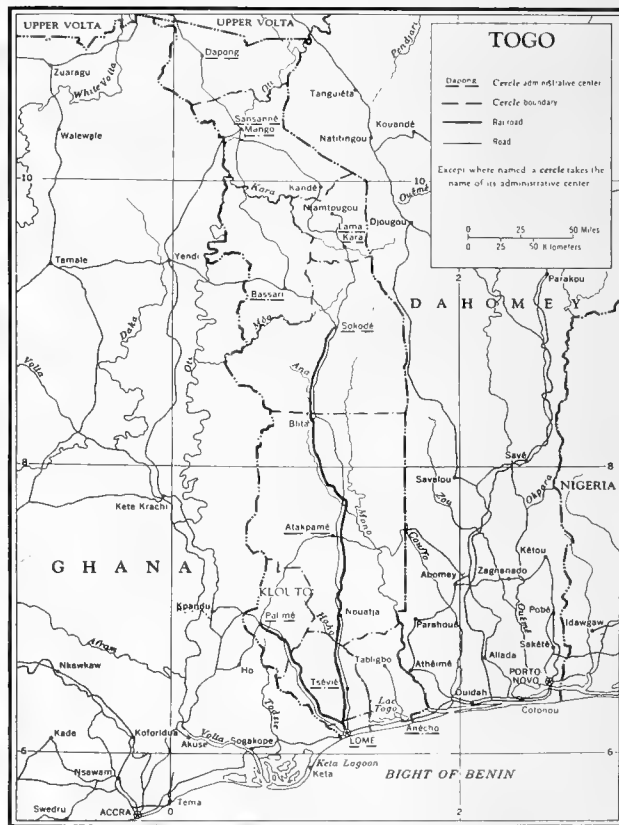
through the use of cooperatives. (United States Embassy, Taipei, October 19, 1962.)



Togo

FAO FISHERIES EXPERT DESCRIBES PROJECT TO IMPROVE FISHING INDUSTRY:

The fishermen along the 30-mile coast of Togo, located on the northwest edge of the Gulf of Guinea, had given little thought to the use of engine-powered fishing boats until early in 1962 when a fisheries expert of British Guiana, engaged by the Food and Agriculture Organization (FAO), started demonstrating outboard motors.



Togolese fishermen use their long canoes which are made of the wood of samba or cheesewood trees. While graceful and picturesque, these primitive craft take a long time to make and, as only coconut palms grow along Togo's coast, the boats cannot be constructed locally. They have to be bought in neighboring Ghana. However, there are about 240 of boats owned by Togolese fishermen's families, and every year about another

Togo (Contd.):

130 of the little vessels owned by Ghanaian fishermen join the Togolese fleet. Each boat has a crew of 9, 4 on each side to paddle and one to steer, and, on an average, there are 4 women fishmongers per craft. The whole fisherman's family participates in the processing and marketing of the fish. In all, about 300,000 people subsist from this primitive fishing industry.

Togo, like many other African countries, suffers from a shortage of protein-rich food and the Government realizes that the development of fisheries could make a valuable contribution to the relief of this problem. The Food and Agriculture Organization is working on a project to improve fishing gear and methods so that more, better, and cheaper fish be made available for Togolese consumers.

"I came here as a general adviser," stated the British Guinea fisheries expert in an interview in Lome, the capital city of Togo, "but neither the Government nor I myself knew where exactly to start a development program for fisheries. . . . One of the first things I did was to teach my assistants to salt and dry the fish better in order to improve its quality and keeping capacity. With my two assistants we went from village to village demonstrating this small, but most important, improvement in fish processing. I also had a look at the village ovens where the fish is smoked. I realized that the method used was good, but that larger quantities of fish could be smoked with the same amount of fuel by slightly changing the design of the ovens. . . .

"Of course, my work is not limited only to fish processing," stated the fisheries expert. "What the Togolese fisheries industry needs is a real revolution in fishing methods. At present most of the fishing consists in going offshore, dropping a huge net in a half circle, and then pulling it back on-shore; a back-breaking job for very poor catches. The fishermen should go and get the fish at sea using surface, midwater, or bottom nets, fishing pots, traps, floating lines and other simple equipment. I therefore demonstrate these simple methods with the fishing boat I was given by the Government. Through extension work I hope to convince the fishermen gradually to adopt my methods. My practical demonstrations are supplemented by film shows. . . .

"Mechanization, of course, is also a very important aspect of the work. Through the use of small outboard motors the catches could be considerably increased. Two private firms in Lome have each given me an outboard engine for demonstration and in a matter of a few weeks I was able to convince two of the richer fishermen to buy a motor. Under the Freedom from Hunger Campaign, Togo will be among the first recipients of outboard motors, offered by the American Outboard Marine Corporation. This should be a considerable step forward for the Togolese fisheries industry.

"I realize, of course, that I cannot deal with all the technical aspects of the fisheries industry without increasing the number of progressive and trained fishermen in the country. I therefore concentrate on the educational aspects of the program. . . . The United States Technical Assistance Agency (AID) and the Federal Republic of Germany have also offered to finance several fellowships on fish technology, smoking, and processing. The Peace Corps will send eight volunteers to Togo to assist me in my work.

"It is too early yet to assess the result of my one-year assignment," he stated, "but the developments up to now are far beyond my expectations and I am convinced that Togo is on its way to establishing a modern fishing industry which will increase the income of the fishermen and supply protein-rich food to a country badly in need of meat and fish." (Food and Agriculture Organization, Rome, Italy, November 18, 1962.)



Tunisia

TERRITORIAL WATERS AND FISHING LIMITS EXTENDED:

The new law (No. 62-35, October 16, 1962) amends the Tunisian decree of July 26, 1951, to extend both territorial waters and fishing limits.

The effect of the new legislation is to establish as Tunisian territorial waters a band 6 miles about the coast from the Algerian border on the east to Ras Kapoudia, and out to the 50-meter (about 27 fathoms) isobath from Ras Kapoudia to the Libyan frontier on the west. In addition, a fishing zone reserved to Tunisian flag vessels is established to a distance of 12 miles from a base line,

Tunisia (Contd.):

between the Algerian frontier and Ras Kapoudia. (United States Embassy, Tunis, October 19, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 85.



United Kingdom

FISHERY LOANS

INTEREST RATES REVISED:

The British White Fish Authority announced the following interest rates on loans made to processing plants as from October 6, 1962: on loans for not more than 15 years, 7 percent, decrease $\frac{1}{4}$ percent; on loans for more than 15 years, but not more than 20 years, $7\frac{1}{8}$ percent, decrease $\frac{1}{8}$ percent.

The rates on loans made for fishing vessels, new engines, nets, and gear were unchanged. (The Fishing News, October 12, 1962.)

Note: See Commercial Fisheries Review, November 1962 p. 83.

* * * * *

WHITE FISH AUTHORITY SETS UP
NEW ENGINEERING UNIT:

The engineering unit which the White Fish Authority (WFA) is setting up in Hull to develop new techniques in the fishing industry was due to begin operating fully by the end of 1962, a spokesman for the WFA stated.

The aim is for four technicians with a small clerical staff to work under a director.

It is not proposed, the spokesman said, that vessels for experimental techniques would be chartered by the WFA. The WFA hopes to work in cooperation with trawler owners in Hull in the development of new techniques to handle and unload catches at sea and in port, to deal with new methods of refrigeration, and other new shipping arrangements. (Fish Trades Gazette, August 18, 1962.)

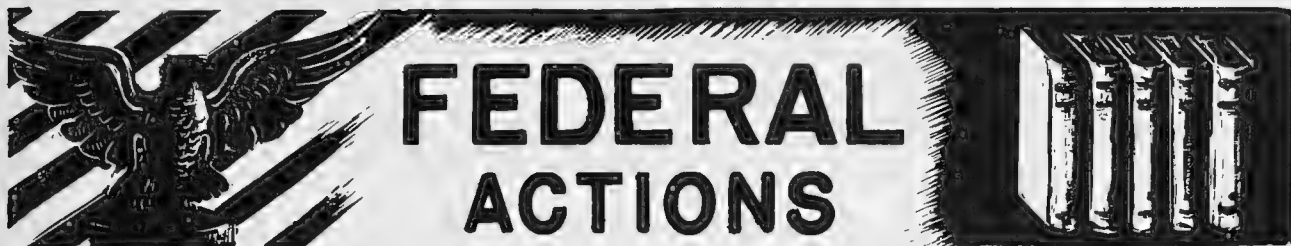


CANADIAN SALMON CAUGHT OFF GREENLAND

On October 10, 1960, an Atlantic salmon 71 cm. (28 inches) total length, weighing 3.7 kilograms (8.2 lbs.), and carrying Fisheries Research Board of Canada tag No. 1,616, was caught in the sea off Tassiusaq (65°06' N., 52°08' W.), near Napossok to the south of Sukkertoppen, Greenland. The fish was tagged on May 22, 1959, in the estuary of the Miramichi River near Chatham, New Brunswick (47°04' N., 65°28' W.), as a smolt 17.5 cm. (6.9 inches) in total length. It was one of 3,500 smolts tagged there in May and June 1959.

Scales from the recaptured fish show three years of river life typical of Miramichi River smolts, followed by a first sea year of moderate growth and a relatively wide winter band. The second sea year includes a period of fast growth followed by a summer check, then a period of fast growth continuing to the time of capture in October 1960.

This recapture represents the longest migration yet recorded, about 1,500 miles, for Canadian Atlantic salmon the river of origin of which is known through fin-clipping or tagging. Many fin-clipped salmon from Quebec, New Brunswick, and Nova Scotia rivers have been recaptured, however, in sea fisheries as far away as Newfoundland and Labrador. The recapture also lends some support to the suggestion that salmon from both sides of the North Atlantic share common feeding grounds. The first direct evidence of Scottish salmon reaching Greenland waters was provided by the recapture in October 1956 near Sukkertoppen, Greenland, of a fish tagged as a kelt in November 1955 at Loch na Croic, Ross-shire. (Nature, October 21, 1961.)



Department of State

SODIUM ALGINATE IMPORT DUTY REDUCED:

Sodium alginate, a seaweed colloid, was among 17 items recently listed for duty reductions of 20 percent in a trade agreement with the United Kingdom, signed by the United States on December 10, 1962, the Department of State announced. The agreement between the two countries was made to compensate for the escape clause actions taken by the United States to increase its import duties on certain carpets and glass.

During 1961, the United States imported 299,900 pounds of sodium alginate, valued at \$210,000 from the United Kingdom. In the same year, 95,688 pounds, valued at \$67,477, was also imported from other countries (mainly from France and Norway). The new ad valorem import duties applicable to imports from the United Kingdom and the other supplier countries are:

New Ad Valorem Duties on U. S. Imports from
United Kingdom and Other Countries

Schedule A No.	Description	Rate of Duty		
		July 1, 1958	Jan. 1, 1963	Final Stage
8350110	Sodium Alginate	12½	11	10

* * * * *

AGENCY FOR INTERNATIONAL DEVELOPMENT

FOREIGN CURRENCIES SET ASIDE FOR LOCAL CURRENCY LOANS:

A new list of 27 countries in which foreign currencies are available for lending to qualified United States firms was announced on October 11, 1962, by the State Department's Agency for International Development (AID).

Funds equivalent to \$206 million (designated as "Cooley" funds) have been set aside

in 26 countries. In 20 of those countries, the Agency for International Development is actively encouraging loan applications from United States businesses or their affiliates, for development or expansion of their foreign operations. In six countries, the local funds that were available during October 1962 exceeded the applications that were received.

So called "Cooley loans" are also available to foreign firms if their proposed use will result in the expansion of markets for United States agricultural products. The program is named after Congressman Harold D. Cooley of North Carolina who sponsored the amendment to Public Law 480

Cooley Loan Currencies

Country	Unit of Currency	Foreign (In Millions)	U. S. Equivalent (In Million \$)
<u>Near East and South Asia:</u>			
Ceylon	Rupee	19.3	4.0
Egypt (UAR)	Pound	20.7	47.0
Greece	Drachma	48.1	1.6
India	Rupee	355.2	75.2
Iran	Rial	124.1	1.6
Israel	Pound	21.4	7.1
Pakistan	Rupee	66.5	14.1
Syria (SAR)	Pound	17.3	4.8
Turkey	Lire	95.7	10.6
<u>Far East:</u>			
China	New Taiwan Dollar	337.9	8.4
Indonesia	Rupiah	735.9	16.4
Korea	Won	202.7	1.6
Philippines ^{1/}	Peso	9.5	2.4
Vietnam	Piastre	215.2	3.0
<u>Africa-Europe:</u>			
Finland	Markka	240.7	.8
Guinea	Franc	10.6	.04
Morocco	Dirham	8.3	1.7
Sudan	Pound	.04	.1
Tunisia	Dinar	.6	1.4
<u>Latin America:</u>			
Chile ^{1/}	Escudo	.07	.04
Colombia ^{1/}	Peso	12.9	1.5
Ecuador	Sucre	13.5	.6
Mexico ^{1/}	Peso	4.2	.3
Paraguay	Guarani	35.8	.3
Peru ^{1/}	Sole	36.5	1.4
Uruguay ^{1/}	Peso	.1	.01
Total			205.99
^{1/} Applications on hand exceed the current availability of Cooley funds, and new applications were not encouraged at the time of the announcement.			

(Food for Peace). The "Cooley loans" are in local currencies received from the sale of United States agricultural products, and the repayments also are in local currencies.

In addition, local currencies are available for lending in Brazil. As a result of an agreement with that country, the equivalent of about \$7 million in cruzeiros is being made available to private companies through the National Development Bank of Brazil. At least one half of that amount may be lent to United States enterprises.

General inquiries regarding the Cooley program should be addressed to the Private Enterprise Division, Agency for International Development, Washington 25, D. C. Loan applications should be submitted to the appropriate AID Regional Bureau: Near East and South Asia; Far East; Africa-Europe; or Latin America. Applications may also be submitted to the United States AID Mission in the countries involved, in care of the American Embassy. Applications for Brazilian funds should be made directly to the National Development Bank of Brazil.

Brazilian cruzeiros equivalent to not less than \$3.5 million were available for lending to qualified United States affiliates directly from the National Development Bank of Brazil.

Note: See Commercial Fisheries Review, April 1962 p. 67; January 1962 p. 65.



U.S. Tariff Commission

REVISION OF RULES OF PRACTICE AND PROCEDURE:

A revision of its Rules of Practice and Procedure has been issued by the U. S. Tar-

iff Commission. The revision appeared in the Federal Register of December 7, 1962.

The principal purpose of the revision is to provide rules of procedure relating to the functions of the Commission under the recently enacted Trade Expansion Act of 1962. Included in the Rules are the procedures to be followed by industries in filing petitions for tariff adjustment and by individual firms and groups of workers in filing petitions for adjustment assistance.

Note: Copies of the rules may be obtained from the Office of the Secretary, U. S. Tariff Commission, Washington 25, D. C.



Department of the Treasury

EFFECTIVE DATE OF NEW TARIFF SCHEDULES POSTPONED:

The new United States tariff schedules provided for in the Tariff Classification Act of 1962 will not go into effect on January 1, 1963, as originally planned.

The decision to delay the effective date of the new schedules was reached on an inter-agency level, with representation by the Departments of State, Treasury, Defense, Interior, Agriculture, Commerce, and Labor, according to a December 3, 1962, press release from the Treasury Department.

The date on which they will be made effective will be announced later.



CORRECTION

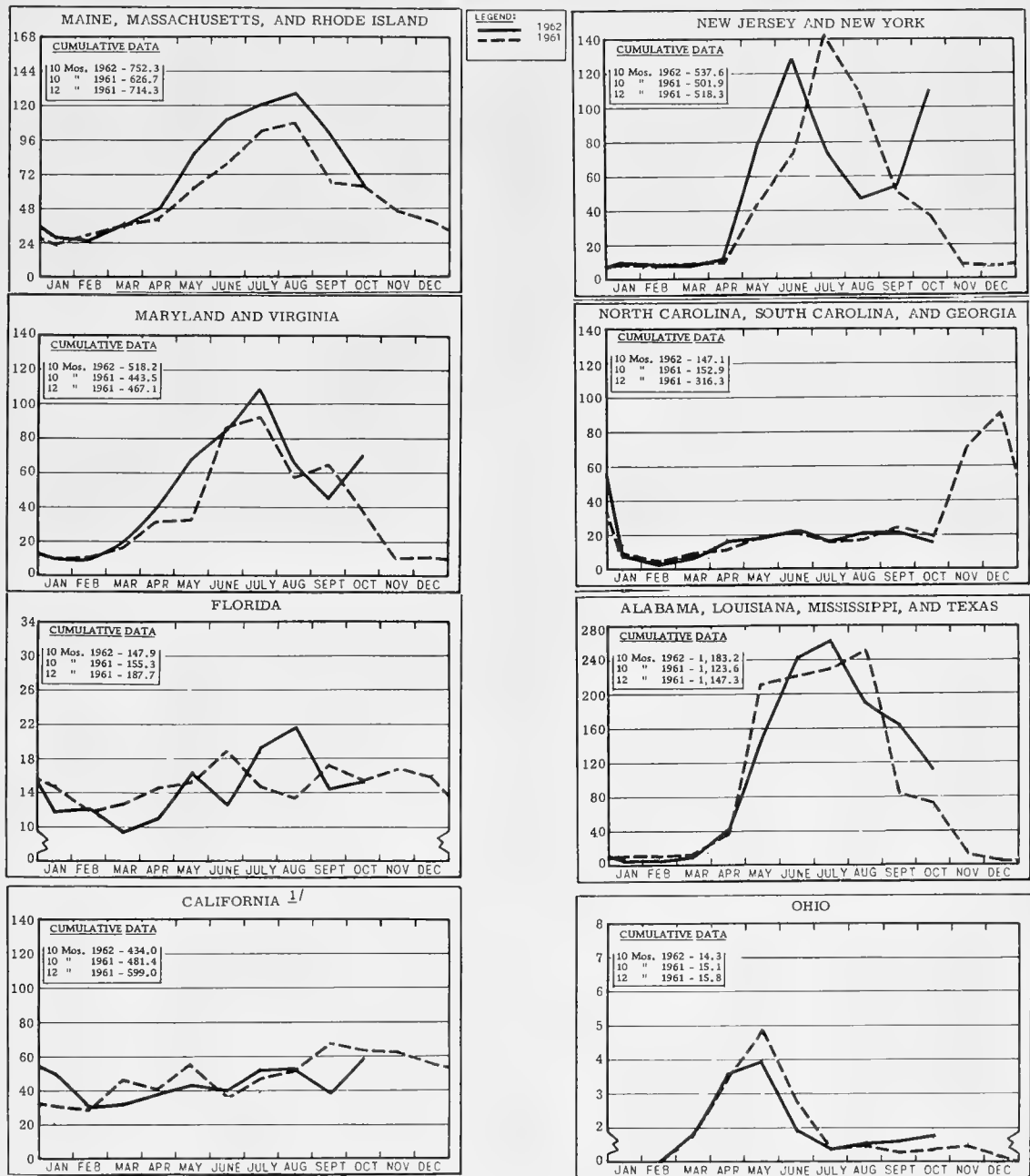
In the February 1962 issue, page 121, under the heading: PACKAGING, a listing of "Vacuum Packaging as a Means for Prolonging the Storability of Smoked Herring Fillets," was incomplete and incorrect. The correct listing is: "Die Vakuumverpackung als Mittel zur Haltbarkeitsverlängerung bei gerauchten Bucklings filets" (Vacuum Packaging as a Means for Prolonging the Storability of Smoked Herring Fillets), by M. v. Schelhorn, article, Allgemeine Fischwirtschaftszeitung, vol. 9, no. 1, 1957, pp. 100-102, printed in German. Allgemeine Fischwirtschaftszeitung, Verlag Carl Th. Gorg, P. O. Box 406, Bremerhaven F., Germany.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

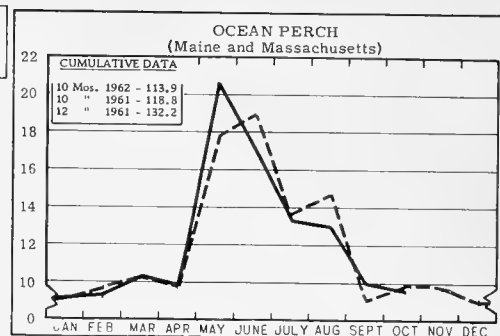
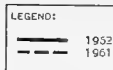
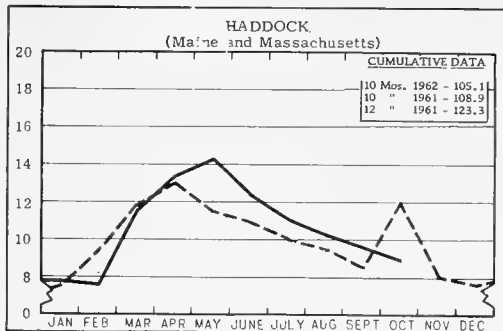
In Millions of Pounds



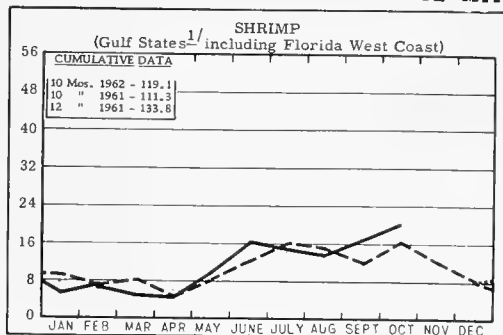
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

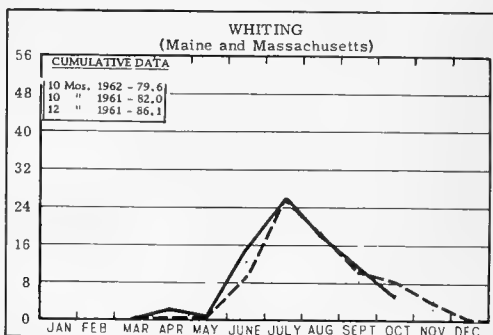
In Millions of Pounds



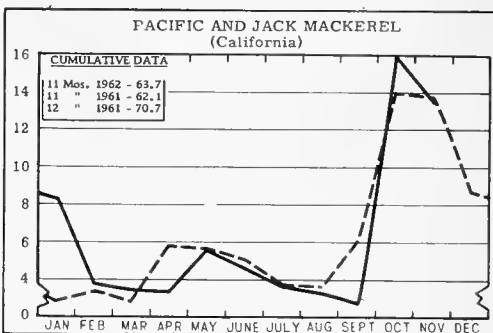
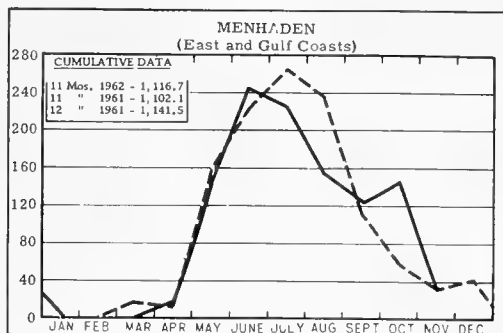
In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.



In Thousands of Tons



In Thousands of Tons

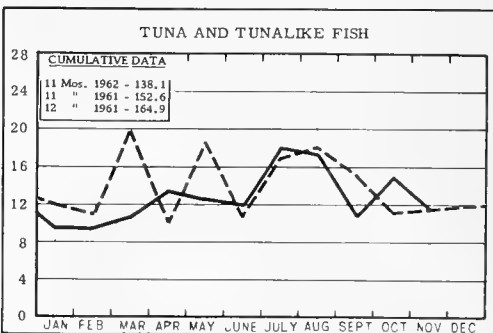
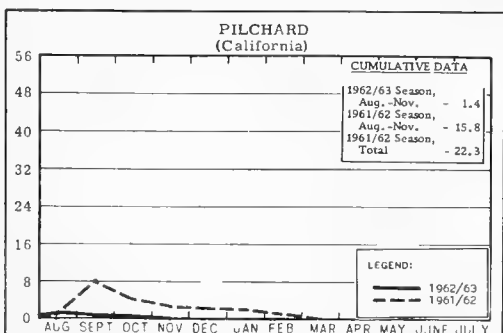
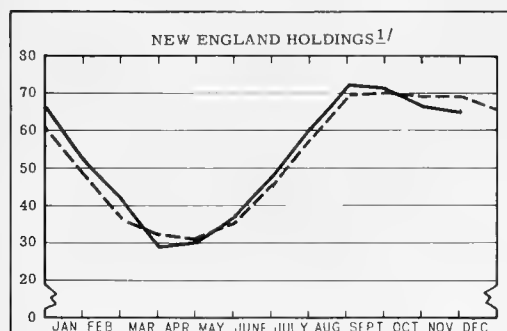
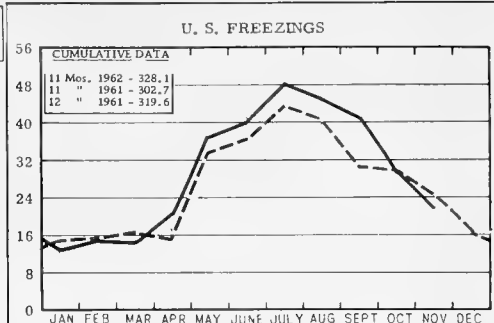
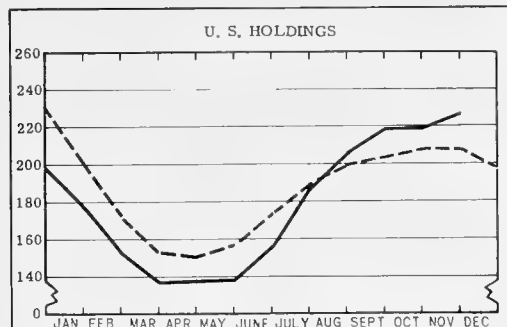
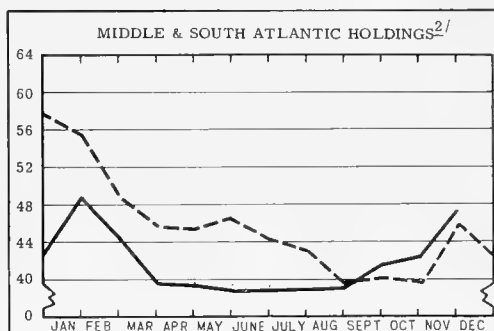


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

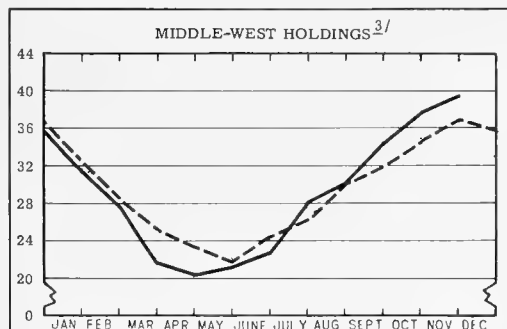
In Millions of Pounds



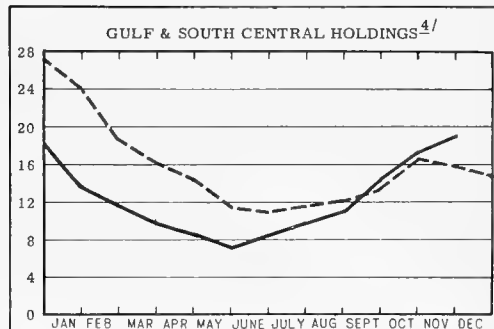
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



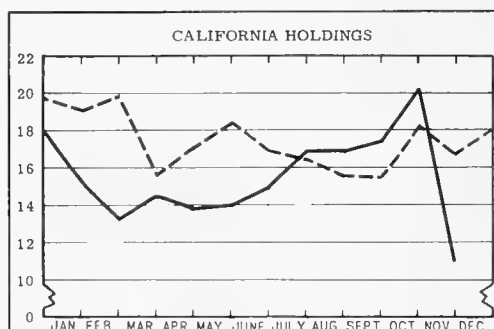
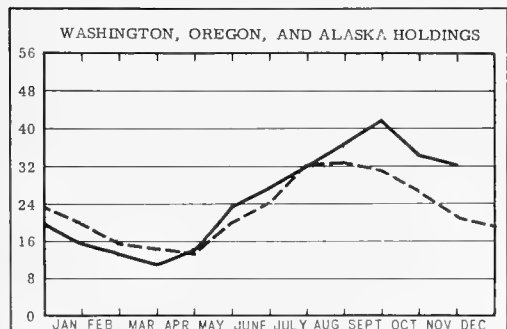
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



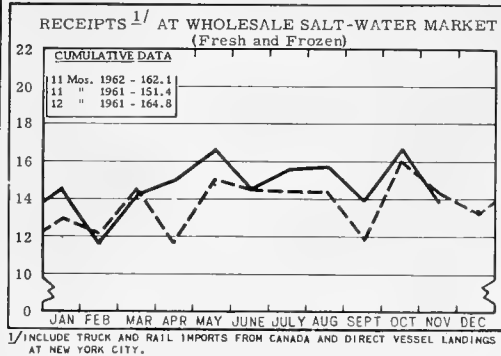
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



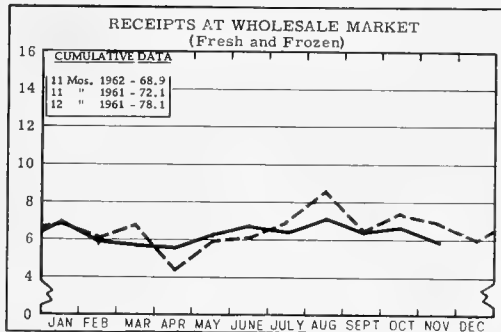
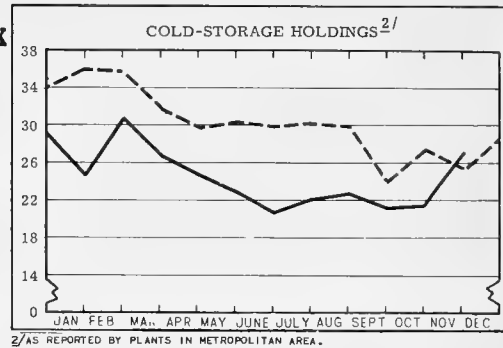
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

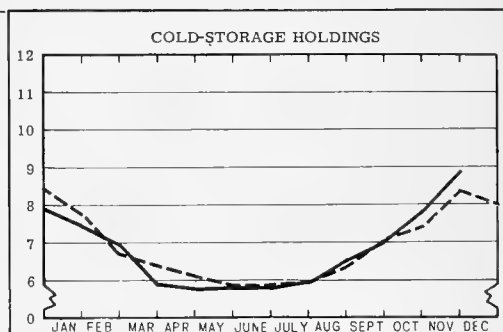
In Millions of Pounds



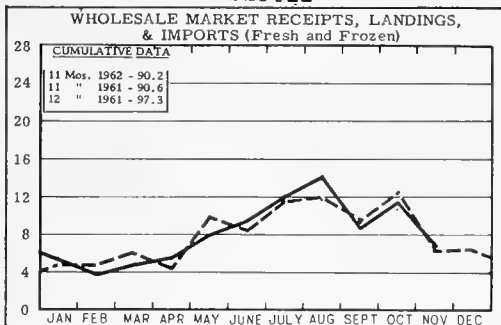
NEW YORK CITY



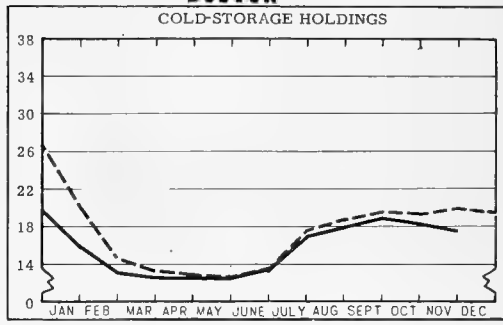
CHICAGO



SEATTLE



BOSTON



LEGEND:
— 1962
- - - 1961

CHART 5 - FISH MEAL and OIL PRODUCTION

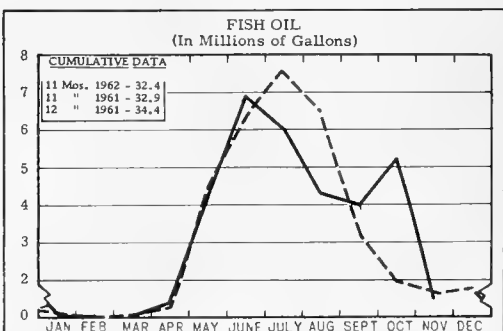
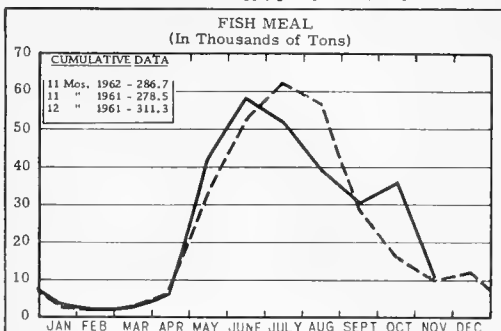
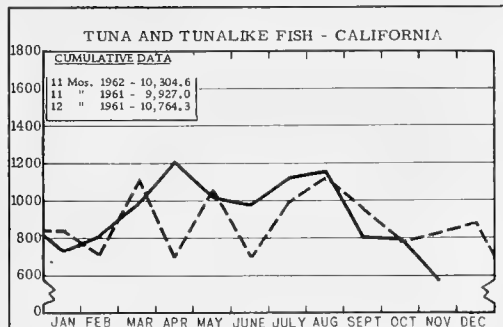
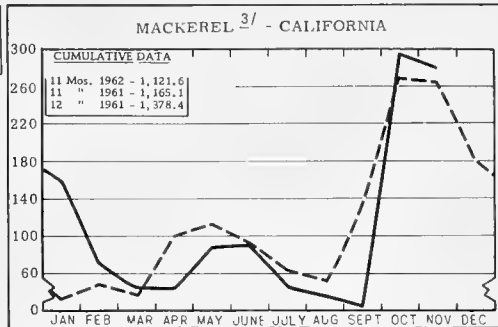


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

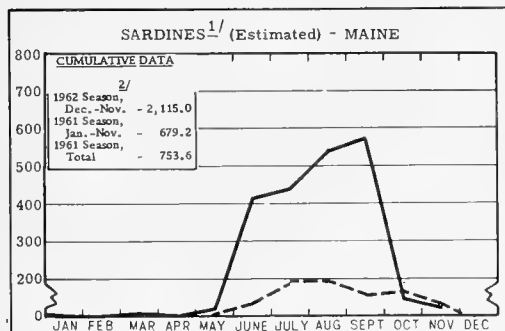
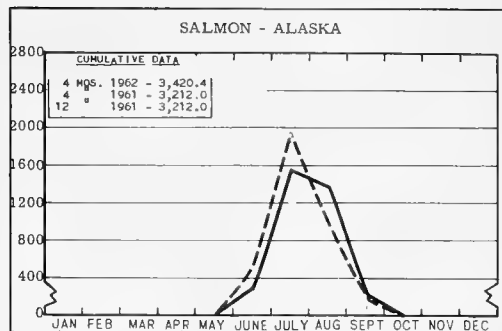
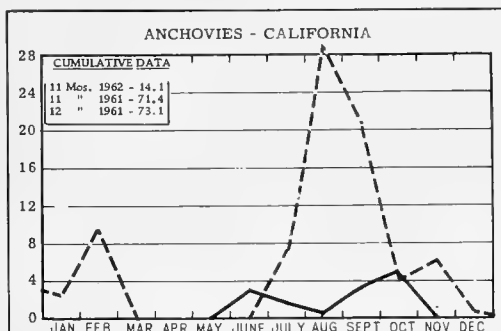
In Thousands of Standard Cases



LEGEND:
— 1962
--- 1961



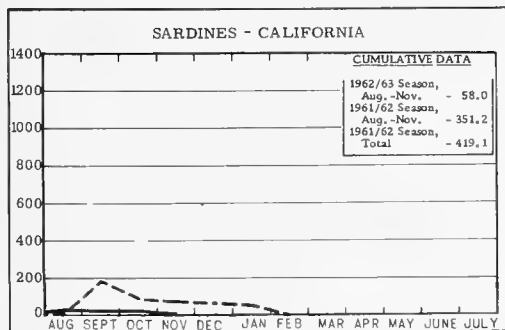
^{3/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES....	100	$\frac{1}{4}$ drawn	$3\frac{3}{4}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:
— 1962/63
--- 1961/62

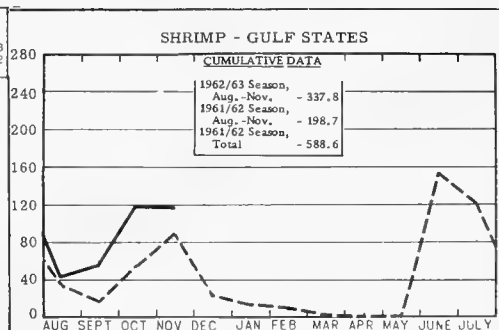
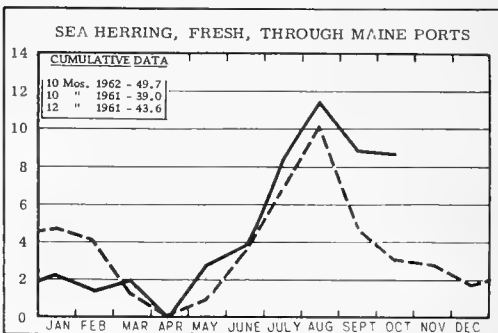
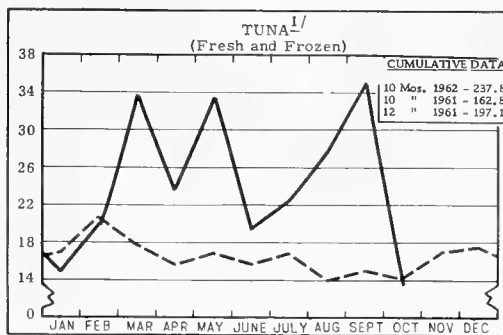
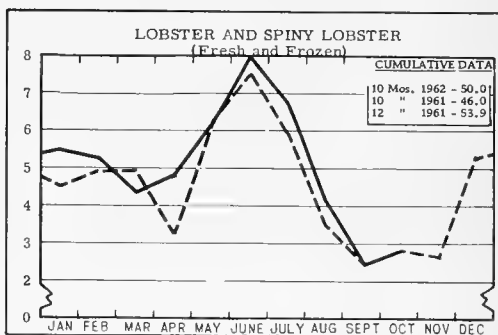
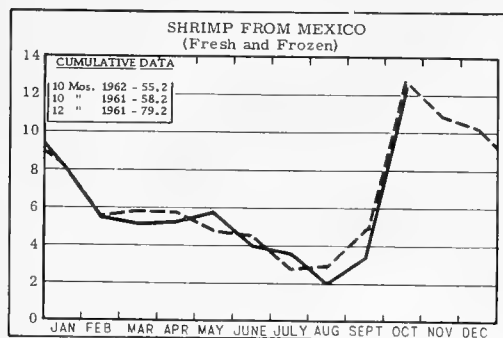
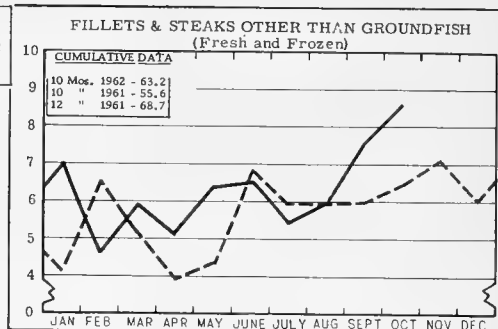
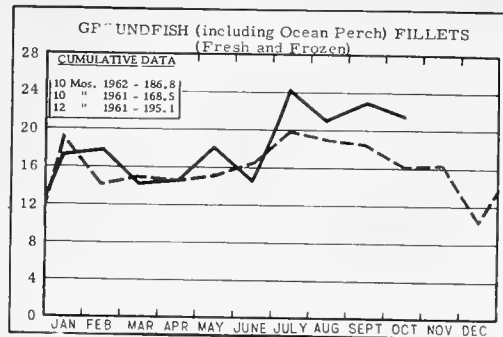
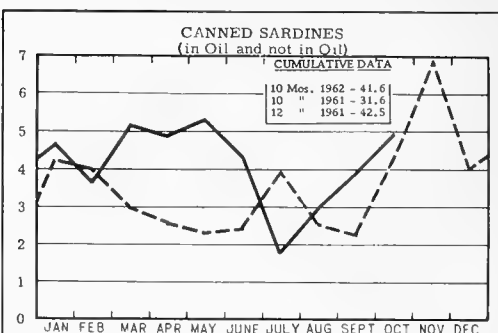
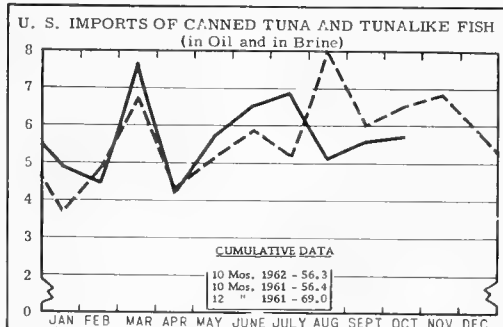


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/} EXCLUDES LOINS AND DISCS.





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

- | Number | Title |
|----------|---|
| CFS-2993 | - Texas Landings, June 1962, 3 pp. |
| CFS-2994 | - California Landings, July 1962, 4 pp. |
| CFS-2996 | - Rhode Island Landings, July 1962, 3 pp. |
| CFS-2999 | - Massachusetts Landings, June 1962, 5 pp. |
| CFS-3000 | - Frozen Fish Report, September 1962, 8 pp. |
| CFS-3013 | - New Jersey Landings, August 1962, 3 pp. |
| CFS-3016 | - Shrimp Landings, May 1962, 6 pp. |
| CFS-3017 | - Virginia Landings, August 1962, 3 pp. |
| CFS-3018 | - Florida Landings, August 1962, 8 pp. |
| CFS-3019 | - Michigan Landings, July 1962, 3 pp. |
| CFS-3021 | - South Atlantic Fisheries, 1961 Annual Summary, 8 pp. |
| CFS-3022 | - Louisiana Landings, May 1962, 2 pp. |
| CFS-3023 | - Alabama Landings, August 1962, 3 pp. |
| CFS-3024 | - Fish Sticks and Fish Portions, July-September 1962, 2 pp. |
| CFS-3025 | - New York Landings, August 1962, 4 pp. |
| CFS-3026 | - Louisiana Landings, June 1962, 2 pp. |
| CFS-3027 | - Mississippi Landings, August 1962, 3 pp. |
| CFS-3031 | - Ohio Landings, August 1962, 2 pp. |
| CFS-3032 | - Alaska Fisheries, 1961 Annual Summary, 8 pp. |
| CFS-3033 | - Rhode Island Landings, August 1962, 3 pp. |
| CFS-3036 | - Maryland Landings, September 1962, 3 pp. |
| CFS-3038 | - Shrimp Landings, June 1962, 5 pp. |
| CFS-3039 | - Maine Landings, August 1962, 4 pp. |
| CFS-3044 | - Florida Landings, September 1962, 8 pp. |

Sep. No. 661 - Snapper Trawling Explorations Along the Southeastern Coast of the United States.

Sep. No. 662 - The United States Fishing Industry and the European Common Market.

Sep. No. 663 - Hydraulic Press for Laboratory Preparation of Fish Press Cake.

SL-120 - Firms Canning Anchovies, 1961, p. 1 (Revised)

Firms Manufacturing, 1961 (Revised):

SL-152 - Oyster Shell Products, 2 pp.

SL-153 - Miscellaneous Industrial Fishery Products, 1 p.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON 5, D.C.

- | Number | Title |
|--------|--|
| MNL-3 | - Legislative Actions Affecting Commercial Fisheries, 87th Congress, 1st. Session 1961, and 2nd Session 1962, 38 pp. |
| MNL-40 | - Fisheries in Morocco, 1961, 15 pp. |
| MNL-60 | - Netherland's Fisheries, 1961, 9 pp. |
| MNL-74 | - Fisheries Survey of Shrimp Fisheries in Guatemala, El Salvador, and Nicaragua, 13 pp. |
| MNL-75 | - Argentina's Fishing Industry, 1961, 8 pp. |

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, September 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, September and October 1962, 18 pp. each (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the months indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, October 1962, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 South Canal St., Room 1014, Chicago 7, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, October 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf

States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City, together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, September 1962, 23 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown, Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--August-September 1962, 18 pp. each (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn., for the months indicated. The September Monthly Summary also includes holdings of selected fishery products, New York Metropolitan Area.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Development of Eggs and Yolk-Sac Larvae of Yellowfin Menhaden, by John W. Reintjes, Fishery Bulletin 202 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 93-102), 14 pp., illus., printed, 15 cents, 1962.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

*PHOTOCOPIES OF ANY LISTED ARTICLE PRECEDED BY AN ASTERISK MAY BE PURCHASED FROM THE JOHN CRERAR LIBRARY, 86 EAST RANDOLPH ST., CHICAGO 1, ILL.

ALGAE:

First Experiment in the Reproduction of Unicellular Green Algae in Open Reservoirs, by N. P. Arutyunyan, USDA Tr A-1356, 7 pp., processed. (Translated from the Russian, *Iz Ak Nauk Armyanskoy SSSR*, vol. 14, no. 5, 1961, pp. 85-91.) Foreign Agricultural Service, Rm. 5609, U. S. Department of Agriculture, 14th and Independence Ave. SW, Washington 25, D. C.

"Some Principles of Intensification of Photosynthetic Productivity of Unicellular Algae," by A. A. Nichiporovich, and V. E. Semenenko, 10 pp., processed. (Translated from the Russian, *Iz Ak Nauk SSSR, Ser Biol*, no. 2, 1962, pp. 163-172.) Foreign Agricultural Service, Rm. 5609, U. S. Department of Agriculture, 14th and Independence Ave. SW, Washington 25, D. C.

ALGERIA:

"La Pêche a Nemours et a Beni-Saf" (The Fishery at Nemours and at Beni-Saf), by J. Couespel du Mesnil, article, *La Pêche Maritime*, vol. 41, no. 1014, September 1962, pp. 633-636, illus., printed in French. *La Pêche Maritime*, 190 Boulevard Haussmann, Paris, France.

AMINO ACIDS:

"Amino Acid Components of Tissues of Crustaceans. I--Amino Acid Components of the Muscles of *Carcinus maenas* from the Time of Passing from Sea Water to Brackish Water During Molt," by Gh. Duchateau, M. Florin, and Ch. Jeuniaux, article, *Chemical Abstracts*, vol. 55, October 2, 1961, 20234g, printed. *Chemical Abstracts*, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"2-Aminoethanesulfonic Acid of Oysters," by Shunji Tanaka, article, *Chemical Abstracts*, vol. 55, May 15, 1961, 9704b, printed. *Chemical Abstracts*, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

ANTIBIOTICS:

"Effects of Tetracycline Antibiotics on the Products of Anserinase Action in Chill Stored Haddock (*Gadus aeglefinus*) Muscle," by B. Sanz Perez and N. R.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Jones, article, Journal of Food Science, vol. 27, January-February 1962, pp. 69-72, printed. Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

AUSTRALIA:

Manufacturing Industries, 1960-61. No. 23--Meat and Fish Preserving, by K. M. Archer, 9 pp., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia, September 18, 1962.

BARENTS SEA:

*"Rezultaty ucheta molodi treski i pikshi v Barentsevom more zimoi 1959/1960 godov" (The Results of a Count of Young Cod and Haddock in the Barents Sea during the Winter of 1959-1960), by A. S. Baranenkova, article, Nauchno-Tekhnika Byulleten Polyarnyi Nauchno-Issledovatel'skaia i Proekte Instituta Morskogo Rybnogo Khoziaistvo i Okeanografiia, vol. 3, no. 13, 1960, pp. 15-20, printed in Russian.

BASS:

"Growth and Survival of Young Spotted Bass in Lake Martin, Alabama, by Bradford E. Brown and Walter M. Tatum (Auburn University Agricultural Experiment Station, Auburn, Ala.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 324-326, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

"White Bass Feeding: Scent or Sight," by George N. Greene (Auburn University, Auburn, Ala.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, p. 326, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Ala.

BIOCHEMISTRY:

*"Fish Hydrolysates. I--Rate of Hydrolysis of Fish Flesh with Papain," by D. P. Sen and others (Central Food Technology Research Institute, Mysore, India); "II--Standardization of Digestion Conditions for Preparation of Hydrolysates Rich in Peptones and Proteoses," by N. V. Sripathy and others, articles, Food Technology, vol. 16, no. 5, 1962, pp. 138-141; 141-142, printed.

*"Studies on the Physiological Chemistry of Phosphorus Compounds in Fish Muscle. IV--On the Seasonal Variation of Phosphorus Compounds Content," by T. Nakano (Holy Ghost Junior College, Akita City, Japan), article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, no. 2, 1961, pp. 147-149, printed in Japanese with English summary.

BIVALVES:

"Effects of Turbidity on Some Larval and Adult Bivalves," by Victor L. Loosanoff (U. S. Bureau of Commercial Fisheries, Milford, Conn.), article, Proceedings of the Gulf and Caribbean Fisheries Institute, vol. 14, 1961, pp. 80-94, printed. Gulf and Caribbean Fisheries Institute, University of Miami, Marine Laboratory, #1 Rickenbacker Causeway, Miami 49, Fla.

BLUEFISH:

"Age in a Small Sample of Bluefish (Pomatomus saltatrix Linnaeus)," by Richard H. Backus (Woods Hole Oceanographic Institution, Woods Hole, Mass.),

article, Breviora Museum of Comparative Zoology (Harvard), vol. 159, 1962, pp. 1-4, printed. Breviora Museum of Comparative Zoology, Harvard University, Cambridge 38, Mass.

*"A Racial Investigation of the Bluefish, Pomatomus saltatrix (Linnaeus) of the Atlantic Coast of North America," by William Albert Lund, Jr. (Instituto Oceanografia, Cumana, Venezuela), article, Boletin Instituto Oceanografia, vol. 1, no. 1, 1961, pp. 73-129, illus., printed in English with Spanish summary.

BROWNING:

"Studies on the Browning of Fish Flesh. VI--Changes of Some Glycolytic Intermediates by Heat," by Fumio Nagayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, February 1961, pp. 158-161, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

BULGARIA:

New Prospects for Bulgarian Fishing, by Mikhail Nishkov, JPRS 14905, 5 pp., processed. (Translated from the Bulgarian, Ribno Stopanstvo, no. 6, 1962, pp. 3-5.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

CALIFORNIA:

California Fish and Game, vol. 48, no. 4, October 1962, 83 pp., illus., printed, single copy 75 cents. California Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif. Includes, among others, articles on: "A Sea Urchin, a Lobster and a Fish, New to the Marine Fauna of California," by John E. Fitch; "The Southern California Mackerel Fishery and Age Composition of the Pacific Mackerel Catch for the 1958-59 Season," by Harold Hyatt; "California Sea Lion Census for 1958, 1960, and 1961," by Wm. Ellis Ripley, Keith W. Cox, and John L. Baxter; "Age and Length Composition of the Sardine Catch Off the Pacific Coast of the United States and Mexico in 1959-60," by Doyle E. Gates and Robert S. Wolf; and "Potential Profits in the California Salmon Fishery," by Donald H. Fry, Jr.

CAMEROUN:

"Pour se developper, la peche camerounaise a besoin d'encouragements et d'aide" (In Order to Develop, the Fishery of Cameroun Needs Encouragement and Aid), article, La Peche Maritime, vol. 41, no. 1014, September 1962, pp. 640-641, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

CANADA:

Fisheries Statistics British Columbia, 1961, 20 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1962. Contains data on quantity and value of fishery products by species, British Columbia, 1949-61; quantity and value by species and fisheries districts, 1960-61; capital equipment employed in primary fisheries operations, 1960-61; and number of persons engaged in primary fisheries operations, 1960-61.

Preparing Shipments to Canada, WTIS Part 2, Operations Report No. 62-50, 18 pp., printed, 10 cents.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.). Goods sent to Canada for consumption in that country are exempt from U. S. export control and do not require a Department of Commerce export license. However, if goods are sent with the knowledge or intention that they will be reexported from Canada to another foreign destination, they are subject to the same export controls as if sent to such other foreign country direct from the United States. The report discusses shipping documents; shipments by mail and truck; labeling, marking, packing; and prohibited or controlled goods. It also discusses entry, transit, and warehousing; abandoned and reexported goods; customs procedures; samples and commercial travelers; advertising matter; and educational films and other material.

CANNED FISH:

"Nutritive Value of Canned Fish: Effect of Canning, Storage, and Antioxidants," by P. L. Sawant and N. G. Magar, article, Chemical Abstracts, vol. 56, March 5, 1962, 5170d, printed, Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

CHAR:

*"O sistematicheskoye polozheniye kamchatskikh gol'tsov roda Salvelinus" (The Taxonomic Status of Kamchatka Chars of the Genus Salvelinus), by K. A. Savvaitova, article, Zoologicheskii Zhurnal, vol. 40, no. 11, 1961, pp. 1696-1703, printed in Russian with English summary.

COALFISH (POLLOCK):

"Om Seiens Ernaering" (On the Food of the Coalfish), by Ulf Lie, article, Fiskets Gang, vol. 48, no. 38, September 20, 1962, pp. 522-525, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

COLOMBIA:

"La Importancia de Nuestra Posibilidad Pesquera" (The Importance of Our Potential in Fisheries), by Antonio Oviedo; "La Situacion de la Pesca en Colombia el Ano de 1961" (The Status of the Colombian Fisheries in 1961), by Jorge E. Carrillo Baron, articles, Peces y Conservas, vol. 2, no. 14, August-September 1962, pp. 22-26, printed in Spanish. Peces y Conservas, Carrera 19-A, no. 12-90, Bogota, Colombia.

COMMON MARKET:

"Los Productos de la Pesca en el Mercado Comun" (Fishery Products in the Common Market), article, Peces y Conservas, vol. 2, no. 14, August-September 1962, pp. 2-4, printed in Spanish. Peces y Conservas, Carrera 19-A, No. 12-90, Bogota, Colombia.

COMPOSITION:

"The Composition of Commercially Important Fish Taken from New England Waters. II--Proximate Analyses of Butterfish, Flounder, Pollock, and Hake, and Their Seasonal Variation," by Richard O. Brooke, Elinor M. Ravesi, and Maynard A.

Steinberg, article, Journal of Food Science, vol. 27, January-February 1962, pp. 73-79, printed, Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Composition of Some Sea and Fresh Water Fishes," by M. Panaiotova and D. Bail'ozov, article, Chemical Abstracts, vol. 56, March 19, 1962, 6429a, printed, Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

CRABS:

"Blue Crab Movement in Coastal South Carolina, 1958-59," by Kenneth J. Fischler and Charles H. Walburg (U. S. Bureau of Commercial Fisheries, Beaufort, N. C.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 275-278, printed, Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

Centolla Industry in Tierra del Fuego. Part 2--April 1962-June 1962 (Continuation from November 1961-January 1962), by Ole J. Heggem, 36 pp., illus., processed, Ministerio de Agricultura, Direccion de Agricultura y Pesca, Santiago, Chile. The first phase of the centolla (king crab) study program consisted of the collection of catch data off Porvenir from October 31, 1961, to January 25, 1962. This paper provides additional data concerning the possibility of a king crab (Lithodes antarcticus) fishery from April to June 1962. During this period trial fishing efforts were made with tangle nets and with Alaskan-type king crab traps. In addition, a brief trial was made with a German herring trawl. Commercial fishing for centollas with traps, trawls, or tangle nets does not appear feasible in the Porvenir during the period of observation from February to the end of June, due to the small catch and poor quality of male centollas at that time.

Notes on the Biology and Economic Importance of the Land Crab CARDISOMA GUANHUMI, Latreille, of Puerto Rico, by Carmelo Feliciano, 32 pp., illus., processed, Department of Agriculture of Puerto Rico, San Juan, Puerto Rico, May 2, 1962. The land crab is commonly known as "Juey" or Cangrejo in Puerto Rico, where its fishery has a considerable local importance. Its flesh is considered a delicacy, and the commercial catch has an estimated value of \$70,000 per year to the fishermen. It is regarded as a pest in the sugar-cane plantations to the point that in certain coastal farms an annual allotment has to be set for its control. This paper embodies the results of observations on the life history and ecological aspects of this species both in the laboratory and in the field, and of the current practices followed by the fishery. The study was undertaken from July 1957 to June 1958 to procure biological and economic information to provide a sound basis for the conservation and management of the resource.

CRUSTACEA:

The Physiology of Crustacea. Volume II--Sense Organs, Integration and Behavior, by Talbot H. Waterman, 686 pp., illus., printed, \$22. Academic Press Inc., 125 E. 23rd St., New York 10, N. Y.

DENMARK:

Import Tariff System of Denmark, WTIS Part 2, Operations Report No. 62-51, 2 pp., printed, 10 cents.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM

Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers units of currency, weights, and measures; basis of specific and ad valorem duties; method of payment; preferential duties; general rules on customs classification; internal taxes; general turnover tax; shipping documents; import restrictions; and related information. There is no customs surtax on imports into Denmark.

DOGFISH:

"Norske Pigghamerkinger 1958-61" (Norwegian Spiny Dogfish Tagging, 1958-61), by Olav Aasen, article, Fiskets Gang, vol. 48, no. 37, September 13, 1962, pp. 507-511, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

DOLPHINS:

Man and Dolphin, by John C. Lilly, 310 pp., illus., printed, Doubleday & Company, Inc., Garden City, N. Y., 1961.

DOMINICAN REPUBLIC:

Import Tariff System of the Dominican Republic, WTIS Part 2, Operations Report No. 62-49, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers currency, weights, and measures; bases of duties; payment of duties; preferential rates; customs surtaxes; other taxes collected in customs; excise taxes; wharfage, storage, and other charges; consular documents; trade controls; exchange controls; and other requirements.

ECOLOGY:

*Voprosy ekologii ryb. Sb. rabot (Questions of the Ecology of Fishes. A Symposium), 182 pp., illus., printed in Russian.

EELS:

*"Sluchai obnaruzheniya ugrei v tele drugikh ryb" (Cases in Which Eels Were Discovered in the Bodies of Other Fish), by P. G. Oshmarin and others, article, Zoologicheskii Zhurnal, vol. 40, no. 12, 1961, pp. 1896-1898, printed in Russian with English summary.

FISH BEHAVIOR:

*"Ob osobennostyakh oboronitel'nogo povedeniya stai nekotorykh pelagicheskikh ryb" (Specific Features of the Defensive Behavior of Schools of Some Pelagic Fish), by D. V. Radakov, article, Trudy Instituta Morfologii i Zhivotnykh Akademii Nauk SSSR, vol. 39, 1961, pp. 47-71, printed in Russian.

"The Schooling of Fishes," by Evelyn Shaw, article, Scientific American, vol. 206, no. 6, 1962, pp. 128-138, printed, Scientific American, 415 Madison Ave., New York 17, N. Y.

FISH CULTURE:

*"Voprosy organizatsii rybovodstva" (The Organization of Fish-Raising), by F. Sukhovverkhov, article, Rybovodstvo i Rybolovstvo, vol. 6, 1961, pp. 5-8, printed in Russian.

FISH FEEDING:

"Determination of Feeding Chronology in Fishes," by Reznat M. Darnell and Richard R. Meierotto (Marquette University, Milwaukee, Wis.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 313-320, printed, Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

FISH-LIVER OILS:

"The Glyceryl Ethers in the Liver Oils of Elasmobranch Fish," by Bo Hallgren and Sam Larsson, article, Journal of Lipid Research, vol. 3, January 1962, pp. 31-38, printed, Journal of Lipid Research, University Publishers, Inc., 59 E. 54th St., New York 22, N. Y.

FISH MANAGEMENT:

"The A. B. C.'s of Fish Management," by John R. Greeley, article, Conservationist, vol. 16, no. 4, 1962, pp. 16-17, illus., printed, The New York State Conservation Dept., Rm. 335, State Campus, Albany 1, N. Y.

FISH MEAL:

"Protein, Phosphorus, and Calcium in Samples of Fish Meal Made from the Three Clupeids of Senegal (Ethmalosa fimbriata, Sardinella eba, and Sardinella aurita)," by M. P. Doutre, article, Chemical Abstracts, vol. 55, June 12, 1961, 11695i, printed, Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

FISH MORTALITY:

"Fish Feeding on Imported Fire Ants," by Denzel E. Ferguson (Mississippi State University, State College, Miss.), article, Journal of Wildlife Management, vol. 26, no. 2, 1962, pp. 206-207, printed, Wildlife Society, 2000 P St., NW., Washington, D. C. In the summer of 1960, large quantities of imported fire ants were fed to fish under field conditions and 68 apparently unharmed bluegills were recovered which had consumed 1-78 ants each. One small fish was suspected of dying from eating ants. It is suggested that ants may be capable of killing fish by stinging the lining of the empty stomach, that other food items reduce the probability of such stings, and that any toxins are rendered harmless upon entering the intestine. Fish mortality from ant consumption is presumed to be a rare phenomenon, if it occurs at all.

FISH OIL:

"Feed Men Hear Report on Recent Work with Fish Oil in Rations. Part 4--Fish Meal, Condensed Fish Solubles, Methionine Hydroxy Analogue, and Poultry Byproducts Meal as Variables in Broiler Rations," by Roger Berglund, article, Feedstuffs, vol. 34, March 31, 1962, pp. 6, 70, printed, Feedstuffs, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"The Growth Promoting Properties of Menhaden Fish Oil as Influenced by Various Fats," by Leonard M. Dansky (Lipman Research Center, Augusta, Maine), article, Poultry Science, vol. 41, no. 4, July 1962, pp. 1352-1354, printed, single copy \$2.85, The Poultry Science Association, Texas A and M College System, College Station, Tex.

"Some Responses of Chickens to Menhaden Fish Oil in the Diet," by Hardy M. Edwards, Jr. and J. E.

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Marion (University of Georgia, Athens, Ga.), article, Federation Proceedings, vol. 21, no. 2, 1962, p. 392, printed. Federation Proceedings of American Societies for Experimental Biology, 9650 Wisconsin Ave. NW., Washington 14, D. C.

FISH PASTE:

"Frozen Fish Paste as Material for Fish Cakes," by Kyosuke Nishiya, article, Chemical Abstracts, vol. 55, October 16, 1961, 21411h, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

FISH PONDS:

*"Rybovodstvo Smolenskoi oblasti" (Fish-Raising in Smolensk Oblast), by S. Dorokhov, article, Rybovodstvo i Rybolovstvo, vol. 6, 1961, pp. 9-11, printed in Russian.

FISH POPULATIONS:

"On Estimating Mortality Coefficients in Exploited Fish Populations, Given Two Censuses," by Henry A. Regier (Cornell University Department of Conservation, Ithaca, N. Y.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 283-294, printed. Secretary, American Fisheries Society, 233 Broadway, New York, N. Y., P. O. Box 483, McLean, Va.

*"O prichinakh flyuktuatsii chislennosti ryb" (The Cause of Fluctuations in the Size of Fish Populations), by G. V. Nikol'skii, article, Voprosy Ikhtiologii, vol. 1, no. 4, 1961, pp. 659-665, printed in Russian.

FOOD MANAGEMENT:

Using Storage Controls to Simplify Determination of Daily Food Costs, Food Management Leaflet 5, 12 pp., illus., printed. Cooperative Extension Service, University of Massachusetts, 408 Atlantic Ave., Rm. 303, Boston 10, Mass., 1962. The use of correct storage controls makes it possible for food service operators to determine food cost daily with a good degree of accuracy and a relatively small amount of work. Though most food service operators determine food cost figures at monthly intervals through the use of inventory and purchase figures, many find that the resulting information becomes available too late. Measures that could have been taken to correct bad situations are no longer possible. This leaflet emphasizes the importance of storage as a major control point for management, and describes the storage forms which can be utilized to get good control. Use of the forms are illustrated by examples.

FOOD TECHNOLOGY:

Color of Foods, by Gordon Mackinney and Angela C. Little, 321 pp., illus., printed, \$12.70 in U. S. and \$13.70 foreign. The Avi Publishing Co., Inc., P. O. Box 388, Westport, Conn., 1962. The book's primary purpose is the discussion of the problems confronting the food technologist and chemist when he considers the color of foods. Very aptly, the introduction points out that our perception of the world around us is determined by our sensory impressions; also, that we learn to associate certain objects with certain colors. The first impression of a food is usually visual and a major

part of our willingness to accept a food depends on its color. Since more and more the food industry, including that segment producing fishery products, is becoming more quality conscious, it is important to remember that color can serve as a useful criterion of quality. However, the authors caution that this can be misleading. But they point out that neither natural nor artificial coloring matters should ever be added to cover up a defect, although adding a harmless coloring matter for esthetic reasons can of course be fully justified. The authors show that through visual inspection the observer can draw a number of valid conclusions regarding the state of a food, but subjective evaluations are of limited usefulness, and specifications couched in descriptive language are without question, unsatisfactory. The food technologist must, therefore, necessarily be interested in the objective methods of color measurement, in the specification of color in terms of an established color system, and in the formulation of color tolerances on a quantitative basis. After introducing the subject by discussing vision and the perception of color, the authors review the work which led to the establishment of the C. I. E. and Munsell color spaces. The Lovibond system is considered next, followed by a discussion of the bases for various color collections. The reflectance and transmittance data needed in determining the C. I. E. specifications for color are presented. One chapter deals with the problem of color-difference measurement and another chapter with color tolerances. One chapter adequately covers instrumentation. Also, an entire chapter is devoted to natural coloring matters. Many Federal and state specifications of color are outlined, and the final chapter discusses the trends of research in color of foods. The book has several appendices which contain suggestions for the technologist trying to maintain quality as the food flows into the plant to be processed and stored. One appendix covers visual appraisal of color; another objective measurement of color; and the last, C. I. E. equivalents of the Munsell Value Scales. Although fish is not specifically covered, this book is of interest to fish technologists and processors. The book has a good bibliography.

--Joseph Pileggi

Food Texture, by Samuel A. Matz, 298 pp., illus., printed, \$11.50 in U. S., \$12.50 foreign. The Avi Publishing Co., Inc., Westport, Conn., 1962. This is a comprehensive survey of the technological aspects of food texture. The book consists of four sections. The first two chapters (which make up Section I) include general background information on the subject, a justification of the method of classification used in the next section, and a discussion of the commercial importance of food texture. The chapters that make up Section II discuss in detail the molecular and microscopic features of the basic texture-influencing structures in foods. The effects of some important processing techniques on texture are described in Section III. The processing methods discussed are: blanching, cooking, and canning; freezing; dehydration; radiation; chemical and osmotic processing methods. The spontaneous changes in texture which occur during storage are considered in the final three chapters which make up Section IV. The author admits that some important types of foods had to be treated in a cursory manner. How-

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ever, in view of the importance of fish as a high type of protein food, it would seem to me that fish and fishery products should have been given a little more adequate treatment. Each chapter concludes with a bibliography, but even here the author, as far as fish is concerned, has failed to list the most important papers written on texture and texture changes in fishery products. Yet this book will be of considerable value to fishery technologists, firms producing food products, and even handlers of food products as it will give the latter group a better understanding of what is involved in packing products of high quality and uniform texture. The book is indexed.

--Joseph Pileggi

FRANCE:

Establishing a Business in France, WTIS Part 1, Economic Report No. 62-68, 12 pp., printed, 15 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses Government policy on investment, entry and repatriation of capital, trade factors affecting investment, business organization, regulations affecting employment, and taxation.

FRESH-WATER FISH:

*"Inventaire biologique des poissons et des pecheries de la region du lac Saint-Pierre" (Biological Inventory of the Fishes and Fisheries of the Lac Saint-Pierre Region), by Jean-Paul Cuerrier, article, Naturaliste Canadien, vol. 89, nos. 6/7, 1962, pp. 193-214, illus., printed in French.

FROZEN FOOD:

"Calculating the Keeping Quality of Frozen Foods," by Mogens Jul, article, Food Manufacture, vol. 36, December 1961, pp. 520-526, printed, Food Manufacture, Leonard Hill, Ltd., 9 Eden St., London NW1, England.

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Fungi in Oceans and Estuaries, by T. W. Johnson, Jr. and F. K. Sparrow, Jr., 662 pp., illus., printed, \$25. Cramer, Weinheim, Germany, 1961.

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"Freezing Resistance in Some Northern Fishes," by Malcolm S. Gordon (University of California at Los Angeles), Ben H. Amdur, and Per F. Scholander, article, Biological Bulletin, vol. 122, no. 1, 1962, pp. 52-62, printed, Marine Biological Laboratory, Woods Hole, Mass.

The Life Story of the Fish: His Morals and Manners, by Brian Curtis, 284 pp., illus., printed, \$1.50. Dover Publications, 1780 Broadway, New York 19, N. Y. Reprint (1949) of informally written book by an ichthyologist for the layman.

*"K metodike issledovaniya rannikh stadii promyslovykh ryb" (A Method for Studying the Early Stages of Commercially Valuable Fishes), by A. S. Baranenkova, article, Nauchno-Tekhnika Byulleten Polyarnyi Nauchno-Issledovatel'skaya i Proekte Instituta Morskogo Rybnogo Khoziaistvo i Okeanografii, vol. 2/3, nos. 16/17, 1961, pp. 10-13, printed in Russian.

GENERAL AGREEMENT ON TARIFFS AND TRADE:

Trade in Agricultural Products--Reports of Committee II on Country Consultations, 504 pp., processed, Sw.Fr. 10.50 (US\$2.43). The Information and Library Services, GATT Secretariat, Villa Le Bocage, Palais de Nations, Geneva 10, Switzerland, 1962. Contains the reports on the consultations held with 38 contracting parties to the General Agreement on Tariffs and Trade on their agricultural policies (including fisheries measures) within the framework of the "GATT Programme for Expansion of International Trade." This program, which aims at the expansion of trade in both the industrial and agricultural sectors, has come to occupy a place of considerable importance in the over-all work of GATT. It was launched in November 1958 following a meeting of Ministers. Three committees were established to operate the Program. One of these, Committee II, was entrusted with the examination of national agricultural policies of Member governments, and, in particular, the use of non-tariff measures for the protection of agriculture and their effects on the flow of international trade in agricultural products.

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Haddock Bionomics. II--The Growth of Haddock in the North Sea and at Faroe, by Rodney Jones, Marine Research 1962 No. 2, 20 pp., illus., printed, 6s. 6d. (about 90 U. S. cents). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1962.

HAEMOGLOBIN POLYMORPHISM:

"Haemoglobin Polymorphism in Fishes," by Knud Sick, article, Nature, vol. 192, December 2, 1961, pp. 894-896, printed, Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

HAITI:

Import Tariff System of Haiti, WTIS Part 2, Operations Report No. 62-48, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers currency, weights, and measures; bases of duty; payment of duties; preferential tariff rates; additional customs taxes; excise taxes; wharfage and storage; trade controls; consular documents; and related information. There are no customs surtaxes or exchange controls on imports into Haiti.

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Bering Sea Herring and the Prospects for Its Exploitation, by V. G. Lipanov, SH211 E82 No. 379, 3 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 11, 1961, pp. 45-47.) Library, U. S. Department of the Interior, Washington 25, D. C.

The Biology and Fishery of the Gulf of Kandalaksha Herring, by A. P. Vilson, 15 pp., printed. (Translated from the Russian, Materialy po kompleksnomu izucheniiu Belogo Morya, vol. 1, 1957, pp. 90-104.) National Lending Library for Science and Technology, Boston Spa, Yorkshire, England.

The Biology and Fishery of the Gulf of Onega Herring, by A. A. Mikhailovskaya, 16 pp., printed. (Translated from the Russian, Materialy po kompleksnomu izucheniiu Belogo Morya, vol. 1, 1957, pp. 74-89.)

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National Lending Library for Science and Technology, Boston Spa, Yorkshire, England.

Herring Rearing. IV--Rearing Beyond the Yolk-Sac Stage, by J. H. S. Blaxter, Marine Research 1962 No. 1, 18 pp., illus., printed, 6s. 6d. (about 95 U. S. cents). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1962.

*"Morskie ptitsy i razvedka sel'di" (Sea Birds and Reconnaissance for Herring), by D. A. Shubnikov and O. N. Shubnikova, article, Priroda, vol. 11, 1961, pp. 108-109, printed in Russian.

The Present State of the Fishery of the White Sea Herring, and Its Biology, by B. M. Tambovtsev, 30 pp., printed. (Reprinted from the Russian, Materialy po kompleksnomu izucheniyu Belogo Morya, vol. 1, 1957, pp. 44-73.) National Lending Library for Science and Technology, Boston Spa, Yorkshire, England.

*"O promysle belomorskoj sel'di v 1960 g." (The Catch of White Sea Herring in 1960), by B. M. Tambovtsev, article, Nauchno-Tekhnika Byulleten Polyarny Nauchno-Issledovatel'skaja i Proekte Instituta Morskogo Rybnoe Khoziaistvo i Okeanografiia, vol. 2/3, nos. 16-17, 1961, p. 55, printed in Russian.

*"Sel'devye i ikh ispol'zovanie v mirovom rybolovstve" (Clupeids and Their Use by the Fisheries of the World), by I. G. Yudanov, article, Voprosy Ikhtologii, vol. 1, no. 2, 1961, pp. 221-230, printed in Russian.

"A Serological Comparison of Five Species of Atlantic Clupeoid Fishes," by Donald F. Mairs and Carl J. Sindermann (U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me.), article, The Biological Bulletin, vol. 123, no. 2, October 1962, pp. 330-343, illus., printed, single copy \$2.50. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass.

HUNGARY:

*"Rybovodstvo v Vengerskoj Narodnoj Respublike" (Fish-Raising in the Hungarian People's Republic), by L. Pavlov, article, Rybovodstvo i Rybolovstvo, vol. 6, 1961, pp. 53-54, printed in Russian.

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Fisheries of Gujarat, edited by K. V. Navathe, S. B. S. Mani, and S. V. Gokhale, 110 pp., illus., printed. Gujarat Fisheries Central Co-operative Association Ltd., c/o Director of Fisheries, Asarwa, Ahmedabad-11, India. A souvenir publication for the delegates of the first All India Conference of Fishing Gear Technologists and the ninth Meeting of the Central Fisheries Research Committee at Vera-val, November 11-14, 1961, giving information on the existing fishing gear of Gujarat and mechanization in the fishing fleet. Included are articles by fisheries experts on: "Fisheries Development in Gujarat"; "Suggestions on the Development of Fisheries in India"; "Survey of the Offshore Demersal Fisheries of Andhra and Orissa Coasts, 1960"; "Fishing Gear of the Rajkot Division"; "Amilan, a Synthetic Fibre, as a Netting Twine Material"; "Need for Research on the Fishing Gear of Gujarat";

"Trends of Mechanisation in the Fishing Fleet of Gujarat"; and "Gujarat Fisheries Central Co-operative Association Ltd., Aims and Activities." A directory of firms and institutions connected with the fishing industry is also included.

INTERNATIONAL COMMISSIONS:

*"XI sessiya Mezhdunarodnoi komissii po rybolovstvu v severo-zapadnoi chasti Atlanticheskogo okeana (IKNAF)" (The 11th Session of the International Commission on Northwest Atlantic Fishing--ICNAF), by A. A. Volkov, article, Rybnoe Khoziaistvo, vol. 11, 1961, pp. 82-85, printed in Russian.

IRELAND:

Lontaobhas Iascaigh Intire Ioncorportha (The Inland Fisheries Trust Incorporated) Annual Report, 1961-62, 28 pp., printed. Inland Fisheries Trust, 11 Westmoreland St., Dublin 2, Ireland, 1962. This report covers the period from April 1961 to March 1962. Improvement of game fishing waters in 18 counties was continued by the methods of reducing predators, rehabilitation of spawning grounds, and restocking, where feasible. Technical assistance and guidance were given to nearly 70 coarse-fishing centers as well as work on improving access to waters and stocking with suitable fish.

IVORY COAST:

"Developpement de la peche industrielle a Abidjan" (Development of the Commercial Fishery at Abidjan), article, La Peche Maritime, vol. 41, no. 1014, September 1962, p. 639, printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

"La situation et les perspectives de la peche industrielle en Cote d'Ivoire en 1962" (The Position and Prospects of the Commercial Fishery in the Ivory Coast in 1962), article, La Peche Maritime, vol. 41, no. 1015, October 1962, pp. 718-723, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

JAPAN:

Data Record of Oceanographic Observations and Exploratory Fishing, Nos. 5 and 6, 396 and 285 pp. respectively, illus., printed in Japanese and English. The Faculty of Fisheries, Hokkaido University, Hakodate, Hokkaido, Japan, March 1961, March 1962. Consists of data collected on cruises to the Western Caroline Islands, Bering Sea, North Pacific, Tsugaru Straits, South China Sea, and Okhotsk Sea during 1935-39, 1959, 1960, and 1961. Data includes information on tuna long-lining, biological characteristics of salmon, hydrographic observations, plankton, fish larvae, salmon gill-netting, trawling, and related information.

Japanese Fishing Regulations, 1959, no. 34, 831 pp., printed in Japanese. Japanese Fisheries Agency, Tokyo, Japan.

LOBSTER:

"Special Properties of Myosin A Extracted from Striated Muscle from the Lobster," by Yutaka Iguchi, article, Chemical Abstracts, vol. 55, May 29, 1961, 10730i, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

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LONG ISLAND SOUND:

North Shore of Long Island Sound--Watch Hill to New Haven, Small-Craft Chart Series 116, 3 accordion-folded charts, printed, \$1.50. U. S. Coast and Geodetic Survey, New York District Office, 602 Federal Office Bldg., 90 Church St., New York 7, N. Y., October 1962. Contains three accordion-folded charts (Charts 116-1, 116-2, 116-3, tidal data, a tabulation of facilities, and other references--all bound in a new protective wrap-around cover. The three multicolored charts provide basic nautical chart coverage at the scale of 1:40,000, with a number of excellent insets at 1:20,000. Among the insets is a three-panel 13-mile stretch of the Thames River from South of New London to Norwich. Others are: Niantic Bay and River; the Connecticut River from its mouth to Hamburg Cove; Clinton Harbor; Patchogue River at Duck Island Roads; Guilford Harbor and approaches; Branford Harbor; and the Thimbles and vicinity. The tide tables giving predictions for the year are referenced to New Haven and Bridgeport, Conn. Direction and maximum strength of tidal currents at ebb and flood are indicated in red on the charts. Several important changes in the Small-Craft Series are inaugurated in Series 116. The tabulation of facilities, for example, is consolidated into a single unit and published on the inside cover-panel. (The tabulations were previously scattered among the chart panels.) This reference shows facilities available to small craft for docking, supplies, fuel, and services--all keyed to the chart by name and number. The accordion-fold is another new feature. Other references include rules of the road, whistle signals, and instructions for obtaining daily weather forecasts by marine radiotelephone. Series 116 is a companion to Series 117, North Shore of Long Island Sound--New Haven to Throgs Neck, issued in January 1962.

MALAGASY REPUBLIC:

"Pisciculture et peche a Madagascar (1950-1960)" (Fish Culture and the Fishery in Madagascar, 1950-1960), by A. Kiener, article, La Pêche Maritime, vol. 41, no. 1014, September 1962, pp. 642-645, illus., printed in French. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France.

METABOLISM:

*"Rost i dinamika zhirnosti u ryb kak prisposobitel'nye protesessy (na osnovanii eksperimental'nogo issledovaniya sazana v del'te Volgi)" (The Growth and Dynamics of Fat Accumulation in Fishes as Adaptive Processes--on the Basis of an Experimental Study of the Carp in the Volga Delta), by N. I. Chugunova, A. V. Assman, and N. P. Makarova, article, Trudy Instituta Morfologii i Zhivotnykh Akademii Nauk SSSR, vol. 39, 1961, pp. 96-181, printed in Russian.

MICROBES:

"Life of Terrestrial Microbes in Marine Medium--Action of Iodine Compounds," by Jean Brisou, Huguette Vargues, and Jean Cadeillan, article, Chemical Abstracts, vol. 56, March 19, 1962, 6466i, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

MICROBIOLOGY:

"Coliform Bacteria in Sea Water and Shellfish. I--Lactose Fermentation at 35.5° and 44° C.," by A. D.

Tennant and J. E. Reid; "II--The E. C. Confirmation Test for Escherichia coli," by A. D. Tennant and others, articles, Canadian Journal of Microbiology, vol. 7, 1961, pp. 725-731; pp. 733-739, printed. Canadian Journal of Microbiology, National Research Council, Ottawa, Canada.

MISSISSIPPI:

"Commercial Fishing in Mississippi," by C. A. Schutz, article, Mississippi Game and Fish, vol. 24, no. 12, July-August 1962, p. 10, printed. Game and Fish Commission, Box 451, Jackson, Miss. During the 1959-60 season, 1,626 commercial fishing licenses were issued in Mississippi, of which 343 were to regular fishermen and 870 to part-time fishermen. Landings totaled 5,996,000 pounds with a value of \$989,980. About 90 percent of the catch consisted of buffalofish, carp, and catfish. Drum, paddlefish, quillback, and sturgeon composed the remainder.

"Rules and Regulations on Commercial Fishing in Miss.," article, Mississippi Game and Fish, vol. 24, no. 12, July-August 1962, pp. 13, 14, printed. Game and Fish Commission, Box 451, Jackson, Miss. Covers open seasons for commercial fishing; legal tackle--trot lines, snag lines, sethooks, hoop or barrel nets, gill and trammel nets, seines, minnow seines and traps, harpoon rod and longbow, and hand grabbling; and size and possession limits.

MOROCCO:

"La production de la peche marocaine a augmente de 20% en 1961" (Moroccan Fishery Production Increased by 20 percent in 1961), article, La Pêche Maritime, vol. 41, no. 1014, September 1962, pp. 637-638, illus., printed in French. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France.

NETHERLANDS ANTILLES:

Establishing a Business and Investing in the Netherlands Antilles, WTIS Part 1, Economic Report No. 62-69, 16 pp., printed, 15 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses general political and legal framework of the Netherlands Antilles, treatment of aliens, organizing a business, taxation, investment incentives, and development programs. It also discusses exchange controls, trade controls, labor and social legislation, utilities and space costs, transportation and communications, general costs and market considerations, and patents and trademarks.

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"The Use and Selectivity of Small-Mesh Gill Nets at Brooks Lake Alaska," by William R. Heard (U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 263-268, printed. Secretary, American Fisheries Society, 233 Broadway, New York, N. Y., P. O. Box 483, McLean, Va.

NORTH CAROLINA:

"An Annotated Checklist of the North Carolina Bay Lakes Fishes," by Darrell E. Louder (North Carolina Wildlife Research Commission, Raleigh, N. C.), article, Journal of the Elisha Mitchell Scientific

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Society, vol. 78, no. 1, 1962, pp. 68-73, printed. Elisha Mitchell Scientific Society, University of North Carolina, Chapel Hill, N. C.

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"Nutrition of Salmonoid Fishes. X--Quantitative Threonine Requirements of Chinook Salmon at Two Water Temperatures," by Donald C. De Long, John E. Halver, and Edwin T. Mertz, article, Journal of Nutrition, vol. 76, February 1962, pp. 174-178, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

OCEANOGRAPHY:

International Indian Ocean Expedition, Lourenco Marques Regional Meeting, April 30-May 2, 1962, 168 pp., illus., processed. Instituto de Investigacao Cientifica, Caixa Postal 1780, Lourenco Marques, Mozambique, 1962. Contains a list of participants; provisional agenda; discussions, conclusions, recommendations, and agenda of the various working groups; minutes of meetings; final recommendations; and programs and informative documents.

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Development of Parasitofauna in Fishes of New Water Reservoirs, by O. N. Bauer, OTS 61-31053, PL-480, 7 pp., processed. (Translated from the Russian, Trudy Problemnykh i Tematicheskikh Soveshchaniy ZIN, no. 4, 1954, pp. 47-53.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"Geographic Distribution and Incidence of Infection of Cryptobia (Hemoflagellate) from Marine Fishes," by R. G. Strout, article, Journal of Parasitology, vol. 48, no. 2, section 2, 1962, pp. 31-32, printed. American Society of Parasitologists, Colorado College, Colorado Springs, Colo.

PHYSIOLOGY:

Ekologicheskaya Fiziologiya Ryb. I. (Ecological Physiology of Fish. Part I), by N. S. Stroganov, R 24849, printed in Russian. Loan copies available from National Lending Library for Science and Technology, Boston Spa, Yorkshire, England, 1962.

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La Transplantation des Plies en Mer du Nord (The Transplantation of the Plaice in the North Sea), by E. Postel, 7 pp., illus., printed in French. (Reprinted from Science et Nature, no. 52, July-August 1962.) Office de la Recherche Scientifique et Technique Outre-Mer, Service Central de Documentation, 80, Route d'Aulnay, Bondy (Seine), France.

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"Studying the Ever-Changing Sea," by Alister Hardy, article, Nature, vol. 196, no. 4851, October 20, 1962, pp. 207-210, illus., printed, 3s. (about 42 U. S.

cents). Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

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Fulfillment of 1961 Fishing Industry Plan, by Franciszek Golebiowski, JPRS 15245, 10 pp, processed. (Translated from the Polish, Gospodarka Rybna, vol. 14, no. 3, May-June 1962, pp. 6-10.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Trends in the Development of Production in the Fishing Industry, by Stefan Dzierzanowski, JPRS 15245, 7 pp., processed. (Translated from the Polish, Gospodarka Rybna, vol. 14, no. 3, May-June 1962, pp. 3-6.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

POLLUTION:

"Effects of Kraft Pulp Mill Wastes on Fish," by Masaru Fujiya, article, Chemical Abstracts, vol. 56, February 5, 1962, 2776c, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Measurements of Toxicity of Tannery and Textile Wastes and Their Components to Fish by Bioassays," by A. David and P. Roy, article, Chemical Abstracts, vol. 56, April 30, 1962, 10729f, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

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"La Industria Conservera Portuguesa en 1961" (The Portuguese Canning Industry in 1961), article, Industrias Pesqueras, vol. 36, no. 848, August 15, 1962, p. 299, printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-2º, Vigo, Spain.

Licensing and Exchange Controls--Portugal, WTIS Part 2, Operations Report No. 62-53, 4 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses Portuguese import controls, import licensing, exchange control on imports, and export controls. Also discusses United States export and import controls to Portugal and related information.

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"Alimentary Value of Fish Proteins: Effect of Storage on Canned Products," by M. Th. Lanteaume, P. Girard, and J. Guzenec, article, Chemical Abstracts, vol. 54, March 25, 1960, 6994b, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Changes in Protein Specificity Determined by Protective Enzyme Test During Embryonic Development of the Sea Urchin and Fresh-Water Fish," by J. Ishida, article, Chemical Abstracts, vol. 55, August 21, 1961, 16612i, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

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Ways," by Masao Migita and Taneko Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, August 1961, pp. 774-784, printed, Japanese Society of Scientific Fisheries, 6-chome, Shiba-kaigandori, Minato-ku, Tokyo, Japan.

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"Development of an Instrument for Evaluating Texture of Fishery Products," by John A. Dassow, Lynne G. McKee, and Richard W. Nelson, article, Food Technology, vol. 16, March 1962, pp. 108-110, printed, Food Technology, The Garrard Press, 510 N. Hickory, Champaign, Ill.

RADIOACTIVE ISOTOPES:

*"Primenyat' radioaktivnye izotopy v promyshlennom rybolovstve" (Use of Radioactive Isotopes in Commercial Fishing), by V. P. Kondrat'ev, article, Rybnoe Khoziaistvo, vol. 5, 1961, pp. 62-64, printed in Russian.

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"Red Water and Mass-Mortality of Fish Near Cape Town," by John R. Grindley and F. J. R. Taylor, article, Nature, vol. 195, no. 4848, September 29, 1962, p. 1324, printed, 3s. (about 42 U. S. cents). Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

REFRIGERATED VESSELS:

Sudovye kholodil'nye ustanovki (Refrigeration Plants on Ships), by A. P. Dobrovol'skii, #R 24689, printed in Russian. Loan copies available from National Lending Library for Science and Technology, Boston Spa, Yorkshire, England, 1962.

REPUBLIC OF GUINEA:

Investment Law in the Republic of Guinea, WTIS Part 1, Economic Report No. 62-74, 4 pp., printed, 15 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report describing the new Investment Code of the Republic of Guinea. The new law was enacted in order to encourage the participation of foreign private capital in the development of Guinea's resources. The code itself is divided into five parts: Titles I and II define the types of enterprises eligible for benefits under the code and the conditions of eligibility; Title III enumerates the advantages which may be accorded to investments; Title IV outlines conditions governing amortization and transfer of capital; and Title V provides for the negotiation of special conventions by which additional guarantees may be granted firms under the code.

RUMANIA:

Aspects of Labor Productivity in the Fishing Industry, by A. Panait, JPRS 15156, 13 pp., processed. (Translated from the Rumanian, Industria Alimentara (Produse Animale), vol. 10, no. 5, 1962, pp. 135-139.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.)

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"Herring Predation on Pink Salmon Fry in a Southeastern Alaska Estuary," by Fredrik V. Thorstein-

son (U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 321-323, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

*"Immuno-serologicheskie razlichia mezhduraznymi stadami nerki" (Immunoserological Differences Between Individual Schools of Blueback Salmon), by M. G. Zaks and M. M. Sokolov, article, Voprosy Ikhtologii, vol. 1, no. 4, 1961, pp. 707-715, printed in Russian.

*"Nekotorye biologicheskie i prakticheskie vyvody iz opyta akklimatizatsii tikhookean skikh losossei" (Some Biological and Practical Conclusions from Our Experience in Acclimatizing Pacific Salmon), by A. I. Smirnov, article, Byulleten Moskovskogo Obshchestva Ispytatelei Prirody Otdel' Biologii, vol. 67, no. 1, 1962, pp. 149-151, printed in Russian.

*"O sutochnom ritme pitaniya segoletok lososya (Salmo salar L.)" (The Daily Feeding Rhythm of Salmon Fry--Salmo salar L.) by F. Ya. Pinski, article, Byulleten Moskovskogo Obshchestva Ispytatelei Prirody Otdel' Biologii, vol. 67, no. 1, 1962, p. 152, printed in Russian.

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"The Sanitation of Fish Boxes. III--A Comparison of Plastic Coated and Uncoated Wooden Boxes," by R. Spencer, article, Journal of Applied Bacteriology, vol. 24, 1961, pp. 110-115, printed, Journal of Applied Bacteriology, Wallace and Tierman Ltd., Power Rd., London W4, England.

SARDINES:

*"Izmenenie zhirnosti sardiny (Sardinella aurita Valenciennes) raiona Dakara v prednerestovyi period godovogo tsikla" (Variations in Fatness of the Dakar Sardine--Sardinella aurita Valenciennes--during the Prespawning Period of the Annual Cycle), by G. E. Shul'man and V. F. Demidov, article, Zoologicheskii Zhurnal, vol. 40, no. 10, 1961, pp. 1532-1535, printed in Russian with English summary.

"La Sardine: Le ministre des Travaux publics répond a une question écrite de M. Orvoen au sujet des difficultés de la pêche sardinière; A Douarnenez la campagne de la sardine aura donné des résultats décevants; A Lorient, l'abondance de sardine a succédé la pénurie; Aux Sables-d'Olonne la pêche a la sardine n'a pas donné ce qu'elle promettait" (Sardines: The Minister of Public Works Answers a Question Written by M. Orvoen on the Subject of the Difficulties of the Sardine Fishery; At Douarnenez the Sardine Season Appears to Give Poor Results; At Lorient, an Abundance of Sardines Succeds a Scarcity; At Sables-d'Olonne the Sardine Fishery Has Not Yielded What It Promised), articles, La Pêche Maritime, vol. 41, no. 1014, September 1962, pp. 629-632, illus., printed in French. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France.

SEA LAMPREY:

"Comparative Toxicity of 3-Trifluoromethyl-4-Nitrophenol (TFM) to Larval Lampreys and Eleven Species of Fishes," by Vernon C. Applegate and Everett

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L. King, Jr., article, Transactions of the American Fisheries Society, vol. 91, no. 4, 1962, pp. 342-345, printed, Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

"Exposure of Several Developmental Stages of the Sea Lamprey, Petromyzon marinus, to Selective Larvicides," by George W. Piavis, article, Copeia, no. 3, 1962, pp. 652-653, printed, American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

SEA OTTER:

*"O rasprostraneni chislennosti i biologii kalanov" (The Biology and Population Spread of the Sea Otter), by A. M. Nikolaev, article, Trudy Soveshchani Iktiologicheskoi Komissii Akademii Nauk SSSR, vol. 12, 1961, pp. 214-217, printed in Russian.

SEA URCHIN:

"Deoxyribonucleic Acid and Deoxyribonuclease Influence of Deoxyribonucleic Acid and Nucleotides on the Action of Deoxyribonuclease of Sea Urchin Eggs," by G. Kiefer and others, article, Chemical Abstracts, vol. 55, August 21, 1961, 16612b, printed, Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Sulphydryl Groups During Cell Division of Sea Urchin Eggs. IV--Contractile Properties of the Thread Model of KC1-Soluble Protein from the Sea Urchin Egg," by Hikoichi Sakai, article, Chemical Abstracts, vol. 56, April 30, 1962, 10727e, printed, Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

SEAWEED:

"Seaweed Is No Longer a Weed," article, Norway Exports, Autumn 1962, pp. 62-66, illus., printed, annual subscription 20 kroner, £ 1, \$3. Norway Exports, H. Heyerdahls Gate 1, Oslo, Norway. Seaweed is now a valuable crop which is being harvested commercially and exploited industrially. Dried and ground, seaweed is a feed additive for livestock. It also yields alginates for the food industry and other applications. It is a soil conditioner and is rich in vitamins, minerals, and trace elements. Norway with its long coastline and favorable temperature is rich in seaweed, and its commercial development is steadily increasing, although so far only a tiny fraction of the available crop is being utilized.

SHEEFISH:

"The Sheefish of Arctic America," by Edward J. Cramer, article, Alaska Sportsman, vol. 28, no. 11, November 1962, pp. 18-20, illus., printed, single copy 50 cents. Alaska-Northwest Publishing Co., Juneau, Alaska. Discusses the natural history of and fishery for the sheefish, Stenodus leucichthys, called the "tarpon of the North." The sheefish resembles the whitefish, tarpon, snook, and salmon in some respects. Its distribution ranges from certain Arctic watersheds of the U.S.S.R. through Arctic Alaska to Cape Bathurst, Canada. In Alaska it can be taken from Bristol Bay streams northward. It ranges in size from 30 to 80 pounds. Some sheefish live in fresh-water lakes while others are migratory. According to the author, it is

a delicious food fish and has considerable potential both for a commercial and sport fishery.

SHRIMP:

"Biological Observations and Results of the 1960 John N. Cobb Exploratory Shrimp Cruise Off the Central Oregon Coast," by Lael L. Ronholt, article, Oregon Fish Commission Research Briefs, vol. 8, no. 1, 1961, pp. 31-52, printed, Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg.

"The Nutritive Value of Bombay Prawns. II--Chemical Composition and Nutritional Constituents of Penaeid Prawns," by Fatema S. Shaikhmahmud and N. G. Magar, article, Chemical Abstracts, vol. 55, October 30, 1961, 22647h, printed, Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

SIERRA LEONE:

Report on Fisheries, 1961, 12 pp., printed, 1s. 6d. (about 20 U. S. cents). Government Bookshop, Water St., Freetown, Sierra Leone, 1962. Discusses accomplishments of the newly organized Fisheries Department during 1961. Covers research in fish preservation, distribution, and fishing activities of trawlers; a new patrol and research vessel; gear research; the Fisheries Loans and Credit Scheme; and extension of tuna-handling facilities. Also includes statistical tables showing fishery landings by months and by species, register of mechanized fishing vessels, and tuna landings.

SMALL BUSINESS MANAGEMENT:

New Depreciation Guidelines--Realistic and Flexible, by Mortimer M. Caplin, Management Aid 147, 4 pp., processed. Small Business Administration, Washington 25, D. C., November 1962. Discusses the new Depreciation Guidelines and Rules which the U. S. Treasury Department issued July 12, 1962. Treasury officials say that the new schedules automatically permit more rapid and more realistic depreciation than was taken in the previous 20 years on 70 to 80 percent of the machinery and equipment used by American businessmen. Examples are given of how the guidelines apply. The author states that, "As in other areas of management, unless an owner-manager is a tax expert, he may want to get professional help with his depreciation problems."

Small Business Use of Trade Association Programs, by Martin L. King, Donald W. Hill, and Katharine E. Luning, Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C., September 1962. Most small businessmen do not make good use of trade association services that require a working knowledge of business-management principles; require that the businessmen take the initiative in obtaining the service; are based on a business philosophy they do not understand or do not accept; or do not concern immediate, specific problems. The report concludes that trade associations need to reevaluate their objectives, organization, and programs.

SOUTH AFRICA REPUBLIC:

"Fishing Industry: A Tenfold Growth in Twenty Years," by Marcus Arkin (Lecturer in Economic

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

History, University of Cape Town, Cape Town, South Africa Republic), article, Economic Opinion, no. 10, June 1962, pp. 31-36, illus., printed, Netherlands Bank of South Africa, Ltd., P. O. Box 1144, Johannesburg, South Africa Republic. Discusses the growth of the fisheries industry in Cape Province, South Africa Republic. Covers the Benguela Current, bringing rich fisheries resources; increased demand for fishery products, increase of skipper-owned vessels; overseas marketing of spiny lobster, pilchards, and maasbanker; and possibilities of developing domestic markets.

SOUTH DAKOTA:

"Fishes of South Dakota," by Reeve M. Bailey and Marvin O. Allum (South Dakota State College, Brookings, S. Dak.), article, Miscellaneous Publications Museum of Zoology, University of Michigan, vol. 119, 1962, pp. 1-131, illus., printed, Museum of Zoology, University of Michigan, Ann Arbor, Mich.

SOUTH PACIFIC:

"Les activites de la peche en Nouvelle-Caledonie et aux Nouvelles-Hebrides" (The Fishery Activities in New Caledonia and in the New Hebrides), by P. Pelerin, article, La Peche Maritime, vol. 41, no. 1014, September 1962, pp. 646-648, illus., printed in French, La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

SPAIN:

Investigacion Pesquera (Fishery Studies), vol. 19, July 1961, 145 pp., illus., printed in Spanish. Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain. Includes, among others, articles on: "Datos Climaticos del Puerto de Castellon y Termicos de las Aguas Costeras Superficiales en 1959" (Meteorological Data of the Port of Castellon and Temperatures of the Surface Coastal Waters in 1959), by Juan Herrera; "Estudio Quimico Comparativo de las Merluzas Africanas, Merluccius merluccius (L.) y Merluccius senegalensis Cadenat" (Chemical Composition of the African Hakes, Merluccius merluccius (L.) and Merluccius senegalensis Cadenat); "Decapodis Espanoles: XV--Sobre un Raro Crustaceo Decapodo: Albunea carabus (Linneo, 1758)" (Spanish Decapods. XV--A Rare Decapod Crustacean, Albunea carabus--Linneaus, 1758), by R. Zariquiey Alvarez; "Descripcion de Anodontus mauritanicus nov. gen. nov. sp. (orden ateleopiformes) y Cottunculus costae-canariae nov. sp. (Familia Cottidae) de las Costas Occidentales de Africa" (Description of Anodontus mauritanicus nov. gen. nov. sp.--Order Ateleopiformes--and Cottunculus costae-canariae nov. sp.--Family Cottidae--of the African West Coast), by F. Cervigon (two new species of fish from the Mauritanian Coast, West Africa, are described).

Investigacion Pesquera, vol. 20, December 1961, 151 pp., illus., printed in Spanish. Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain. Includes, among others, articles on: "Influencia de las Ecosondas en una Pesqueria de Sardina" (The Effect of Echo-Soundings in a Sardine Fishery), by P. Suau and M. G. Larraneta; and "Captura de un Harriotta raleighana Goode y Bean, 1894, en Aguas de Cabo Blanco--

(Africa Occidental)" (Capture of a Harriotta raleighana Goode and Bean, 1894, in Waters Off Cape Blanco--West Africa), by Julio Rodriguez-Roda.

STERN TRAWLER:

"Successful First Fishing Trips for Stern Trawler Hekktind," article, Norwegian Fishing and Maritime News, vol. 8, no. 2, 1961, pp. 8, 48, printed, Norwegian Fishing and Maritime News, Torolf Holme, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

STRIPED BASS:

"Sexual Maturity as Determined from Ovum Diameters in Striped Bass from North Carolina," by Robert M. Lewis (U. S. Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 279-282, printed, Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

TAGGING:

*"Mechenie donnykh ryb v Barentsevom more (Dopolnenniy tekst doklada, prochitanogo na sovmetnom soveshchanii sovetshikh i norvezhskikh uchennykh v avguste 1958 g.)" (Marking Benthic Fishes in the Barents Sea--Supplemented Text of a Report Read at a Joint Meeting of Soviet and Norwegian Scientists in Aug., 1958), by K. G. Konstantinov, article, Voprosy Ikhtiologii, vol. 1, no. 2, 1961, pp. 275-280, printed in Russian.

*"Mechenie promyslovykh ryb" (Marking of Commercial Fish), by N. E. Aslanova, article, Voprosy Ikhtiologii, vol. 1, no. 3, 1961, pp. 564-569, printed in Russian.

TAIWAN:

The Trade of China, 1961 (Taiwan), Statistical Series No. 1, 422 pp., illus., printed in Chinese and English. Statistical Department, Inspectorate General of Customs, Taipei, Taiwan, 1962. Contains data on Taiwan's foreign trade, including imports and exports of fishery products.

THAILAND:

Agricultural Statistics of Thailand, 1960, 172 pp., illus., printed in Thai and English. Agricultural Statistics Section, Division of Agricultural Economics, Office of the Under-Secretary of State, Ministry of Agriculture, Bangkok, Thailand. Includes, among other information, data on Bangkok fish market receipts and average wholesale prices, 1947-1960; estimated volume and value of fishery landings; number of boats registered for fishing; commercial fishing equipment licenses and fees collected; number and area of Government and privately-owned fish ponds; and fish-fry distribution.

TIDE TABLES:

Tidal Current Tables 1963--Atlantic Coast of North America, 184 pp., printed, \$1. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C., 1962.

TOXICITY:

"Experimental Study of Ichthyotoxicosis Caused by Smoked Tuna," by J. Kriska and others, article, Bulletin of Hygiene, vol. 36, no. 8, 1961, p. 754,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

printed. Bureau of Hygiene and Tropical Diseases, Keppel St., Gower St., London WC1, England.

"Experimental Studies of Ichthyotoxicosis from Smoked Tunny. II--Biological and Chromatographic Proof of Toxic Substances," by M. Ferencik, J. Kriska, and V. Krcmery, article, Chemical Abstracts, vol. 56, May 14, 1962, 12044e, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

TRADE LISTS:

The Bureau of International Business Operations, U. S. Department of Commerce, has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of Foreign Commerce, Washington 25, D. C., or from Department of Commerce field offices at \$1 each.

Oils (Animal, Fish, Vegetable)--Importers, Dealers, Producers, Refiners, Exporters--Belgium, 16 pp., August 1962. Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish and whale oils.

TRAWLER-FREEZER:

"Les Chantiers Augustin Normand ont lance pour Israel le 'Hiram-I' chalutier congelateur a peche arriere" (Augustin Normand Shipbuilders Has Launched for Israel the Stern Trawler-Freezer), Hiram I, article, La Peche Maritime, vol. 41, no. 1015, October 1962, p. 703, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

TRAWLERS:

"A New Trawler," by C. Birkhoff, article, Fette-Seifen-Anstrichmittel, vol. 64, February 1962, pp. 141-144, printed in German. Fette, Seifen, Anstrichmittel, Industrieverlag von Hernhausen K. G., Hamburg 11, Germany.

TRAWLING:

*"Test-Trawling in the Northeast Bering Sea," by Arao Tsuruta, Osamu Hirano, and Akiyoshi Kataoka, article, Journal of the Shimonoseki College of Fisheries, vol. 11, no. 3, 1962, pp. 391-398, illus., printed in Japanese with English summary.

TRAWL NETS:

*"Model Experiment on the Japanese Two-Boat-Type Trawl Net. II--Model Experiment on S-I Type Net Devised Newly, and Consideration Upon the Efficiency of the New Device Connecting with the Behavior of the Object Fishes," by Takeo Taniguchi, article, Journal of the Shimonoseki College of Fisheries, vol. 11, no. 2, 1961, pp. 305-331, illus., printed in Japanese with English summary.

TROPICAL FISH:

Illustrated Dictionary of Tropical Fishes, by Hans Frey, 768 pp., illus., printed, \$7.95. T. F. H. Publications Inc., Jersey City, N. J., 1961.

TROUT:

Disorders in Fat Metabolism of the Liver in Rainbow Trout Bred on Artificial Feeds, by K. A. Faktorovich, OTS 61-31048, PL-480, 6 pp., proc-

essed. (Translated from the Russian, Trudy Soveshchaniya po Fiziologii Ryb, 1956, pp. 237-243.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"Glycogen Stores in Trout Tissues before and after Stream Planting," by P. W. Hochachka, article, Journal of the Fisheries Research Board of Canada, vol. 19, January 1962, pp. 127-136, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

*"Raduzhnaya forel' v Odesskoi oblasti" (The Steel-head Trout in Odessa Oblast), by E. Manuilenko, article, Rybovodstvo i Rybolovstvo, vol. 6, 1961, pp. 26-27, printed in Russian.

TUNA:

"The Concentration of Myoglobin and Hemoglobin in Tuna Flesh," by W. Duane Brown, article, Journal of Food Science, vol. 27, January-February 1962, pp. 26-28, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Las Conservas Norteamericanas de Atun" (North American Canned Tuna), article, Peces y Conservas, vol. 2, no. 14, August-September 1962, pp. 7-9, printed in Spanish. Peces y Conservas, Carrera 19-A, No. 12-90, Bogota, Colombia.

"Sea Temperatures and the Availability of Albacore Off the Coasts of Oregon and Washington," by James H. Johnson (U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, Calif.), article, Transactions of the American Fisheries Society, vol. 91, no. 3, 1962, pp. 269-274, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

TUNA AND SARDINES:

"Bilan de la campagne du thon et de la sardine" (Status of the Tuna and Sardine Season), article, La Peche Maritime, vol. 41, no. 1015, October 1962, pp. 707-709, printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

UNITED KINGDOM:

Grimsby--The World's Premier Fishing Port and Frozen Food Centre, 156 pp., illus., printed. The Grimsby Fishing Vessel Owners' Association, Fish Dock Rd., Grimsby, England, 1961. A handbook covering the history of Grimsby, the fishing industry and how it works, the Grimsby Fishing Vessel Owners Association, welfare work, development of the fishing vessel, development of fishing gear, electronics and radio, fishermen of Grimsby, sales, fish merchandising, processing technique, and quick-freezing and frozen foods. Also covers cold storage; cod-liver oil in modern nutrition; white fish meal; shipbuilding, repairing, and engineering; related trades; coal and oil bunkering; research; chart of the sea fishing industries; meteorological services; The White Fish Authority; fish facts; and dock accommodation. Also contains a plan of docks and map of fishing grounds and a diagram of a trawler and seine net vessel.

Torry Research Station Annual Report, 1961, on the Handling and Preservation of Fish and Fish Products, 48 pp., illus., printed, 4s. (80 U. S. cents postpaid). Department of Scientific and Industrial

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Research, State House, High Holborn, London WC1, England, 1962. (For sale by British Information Services, 45 Rockefeller Plaza, New York 20, N. Y.) Describes accomplishments in research during 1961 on improvement in handling, treatment, and quality of wet fish; freezing and cold storage; smoke curing; salting; canning; and fishery byproducts. Also includes work on culture media for halophiles, metabolism of marine bacteria, chemical changes in sterile and inoculated fish muscle, hydration and dehydration of proteins, and dielectric properties of cod muscle, and related subjects. Also contains a list of reports and papers published during 1961 on the handling and preservation of fish and fish products.

U.S.S.R.:

*"Nekotorye puti uvelicheniya ulovov ryby v morskikh vodoemov" (Some Ways of Increasing the Catch of Fish in Seas of the U. S. S. R.), by T. S. Rass, article, Voprosy Iktiologii, vol. 1, no. 4, pp. 622-639, printed in Russian. On the basis of many years of study of data from the literature and from the statistics of the fishing industry, the possibility was shown of increasing the catches in the seas of the Soviet Far East and adjoining waters of the Pacific Ocean of Theragra chalcogramma, Cololabis saira, Pleurogrammus monopterygius, and P. azonus. By developing a fishery for these species, it will be possible to obtain annually an additional 4.5 to 6 million metric centners of fish, which is half again as much as the present catch in this area of the U.S.S.R. The author gives reasons for the practical expediency and the biogeographical possibility of increasing the numbers of commercially important fish in some of the seas of the U.S.S.R. by introducing commercially valuable species of fish. He considers it possible to introduce P. monopterygius and Lepidopsetta bilineata into the Barents Sea and Gadus callarias and Pseudosciaena polyactis into the Black Sea.

Pervichnaia produktsiia morei i vnutrennikh vod (Primary Production of Marine and Inland Waters), #R 24864, printed in Russian. Loan copies available from National Lending Library for Science and Technology, Boston Spa, Yorkshire, England, 1961.

*"Rasselenie sudaka po ozeram Karelii" (Introducing Pike Perch into the Karelian Lakes), by L. A. Kuderskii, article, Priroda, vol. 11, 1961, pp. 109-111, printed in Russian.

*"O ratsional'nom ispol'zovanii kormovykh zapasov Volgi" (Efficient Use of the Stocks of Fish Food in the Volga), by P. N. Khoroshko, article, Rybnoe Khoziaistvo, no. 4, 1961, pp. 22-23, printed in Russian.

*"Rybnoe khoziaistvo Orenburgskoi oblasti" (Commercial Fishing in Orenburg Oblast), by G. Mikhachenkov and K. Sadlaev, article, Rybovodstvo i Rybolovstvo, vol. 6, 1961, pp. 18-19, printed in Russian.

*"Stoletie biologicheskikh rybokhoziaistvennykh issledovaniy v nashei strane" (The Centennial of Biological Commercial Fishing Investigations in Our

Country-USSR), by A. A. Svetovidova, article, Voprosy Iktiologii, vol. 1, no. 3, 1961, p. 591, printed in Russian.

*"Ves molodi sudaka, vypuskaemoi iz donskikh nerestovo-vyrastnykh khoziaistv" (The Weight of Young Pike Perch Released from the Don River Fish Hatcheries), by N. N. Zhdanova, article, Rybnoe Khoziaistvo, vol. 10, 1961, pp. 19-22, printed in Russian.

VESSELS:

A Tuna Clipper, by V. F. Bezukladov, JPRS 14842, 9 pp., processed. (Translated from the Russian, Sudostroyeniye, no. 3, 1962, pp. 1-4.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

VIET-NAM:

Import Tariff System of Viet-Nam, WTIS Part 2, Operations Report No. 62-52, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers units of currency, weights, and measures; basis of duty assessment; method of payment of duty; duties--preferential treatment; customs surtaxes; sales and other internal taxes; documentation and fees; trade restrictions; and related information.

WHALE:

"The Optical Rotatory Dispersion of Right-Handed Helices in Sperm Whale Myoglobin," by Peter J. Urnes, K. Imahori, and Paul Doty, article, Chemical Abstracts, vol. 56, March 19, 1962, 6342b, printed. Chemical Abstracts, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

*"O prodolzhitel'nosti zhizni finvalov i periodike ikh razmnozheniya" (The Longevity of Fin Whales and the Periodicity of Their Reproduction), by V. A. Zemskii, article, Trudy Soveshchaniy Iktiologii Akademii Nauk SSSR, vol. 12, 1961, pp. 60-67, printed in Russian.

WHITEFISH:

*"O rezul'tatkakh akklimatizatsii i usloviyakh razmnozheniya sigov v Rybinskom vodokhranilishche" (The Results of Acclimatization and the Conditions for Reproduction of Whitefish in the Rybinsk Reservoir), by A. G. Poddubnyi and V. A. Sakharova, article, Byulleten Instituta Biologii Vodokhranilishch Akademii Nauk SSSR, vol. 10, 1961, pp. 42-45, printed in Russian.

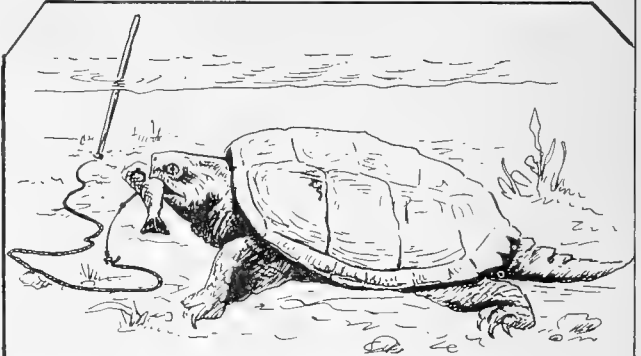
*"Sigovye v Khar'kovskoi oblasti" (Coregonids in Khar'kov Oblast), by G. Shkorbatov and G. Kudryavtseva, article, Rybovodstvo i Rybolovstvo, vol. 5, 1961, p. 20, printed in Russian.

WHITEFISH AND GRAYLING:

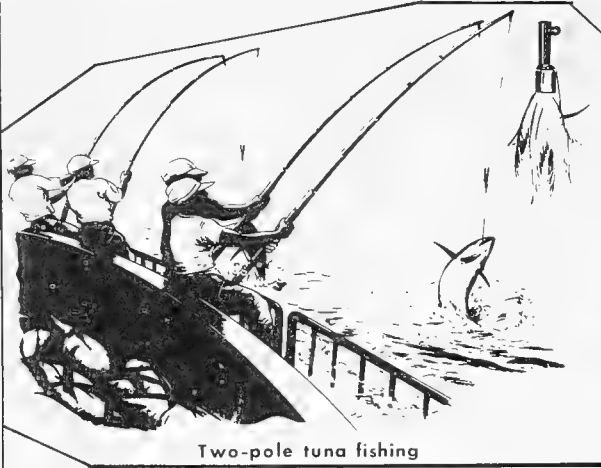
*"Tsitofiziologicheskii analiz vnutrividnoi differentsirovki omulei i khariusoov ozera baikal" (Cytophysiological Analysis of Intraspecific Differentiation in the Whitefish and Grayling of Lake Baikal), by B. P. Ushakov, A. N. Vinogradov, and A. A. Kusakina, article, Zhurnal Obshchei Biologii, vol. 23, no. 1, 1962, pp. 56-63, printed in Russian.

HANDLINES

A handline is a single line with one or more hooks held or attended by one person. In some cases, the line is attached to a pole. In the West Coast tuna fishery, a single barless hook is attached to from one to four lines, depending on the size of the fish being taken. Each line is fastened to an individual pole attended by one person. A single line, with one or more baited hooks, attached to a single float, jug, or stake, is likewise a handline. When used in this latter fashion, it requires only periodic attention. (This type of gear has been incorrectly classified in some states as a trotline or longline.)



Handline



Two-pole tuna fishing



Handline

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, Helen Paretti, and Raie Carron,

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Cover page--Public Relations Office, Port of Seattle, Wash.; pp. 21 (fig. 1), 22 (fig. 2)--Alaska Dept. of Fish and Game; p. 22--Chas. F. Connelley, Jr., Juneau, Alaska; pp. 34 (fig. 1), 36, & 77 (fig. 2)--F. B. Sanford and C. F. Lee; pp. 39 & 40--John Shea; pp. 49 & 50--Sheldon Dobkin; p. 51 (fig. 2)--J. Pileggi; p. 56 (right)--L. C. Ringhaver, Diesel Engine Sales Co., St. Augustine, Fla.; p. 57--Robert K. Brigham; p. 62 (fig. 1)--Fishery Technological Laboratory, E. Boston, Mass. and (fig. 2)--Andrew L. Pinto; pp. 67 & 78 (fig. 3) and 76 (fig. 4)--FAO; p. 75 (fig. 2)--Walter H. Stoltz; pp. 76 (figs. 3, 6, & 7) Patrick Morin, FAO and fig. 5, and 108--J. O. Traung, FAO; pp. 77 (fig. 1), 111 (figs. 1 & 2)--Milton Lindner, U. S. Embassy, Mexico; p. 78 (fig. 2)--Jack W. Schott; p. 83 (figs. 1 & 2)--E. R. Pariser; pp. 84 (fig. 1), 85 (fig. 2), and 86 (fig. 3)--Turistforeningen for Danmark Billed, Arkiv; pp. 102 & 104--Consulate General of Japan, N. Y.; p. 112 (figs. 1 & 2)--United Nations; pp. 114 & 115--Albert C. Jensen; pp. 117 (fig. 2) and 118 (fig. 3)--Office of Information, Commission on Rural Reconstruction, Taiwan; and p. 118 (fig. 4)--Information Office, FAO Mutual Security Mission to China.

EVALUATION NEEDED OF EFFECTIVENESS OF ARTIFICIAL REEFS TO ATTRACT MARINE FISH

For over ten years, sport fishing promotional groups have been dumping everything from concrete-filled beer cases to old car bodies and streetcars into marine waters of the United States to create artificial reefs.

A small reef in California is built of 20 car bodies; an Alabama reef utilizes a scuttled 5,000-ton drydock; a third is composed partly of artificial rocks from a movie set; and others use building rubble, sunken boats, or concrete pilings. Plans call for a New Jersey reef using 7,000 concrete-filled car tires.

The purpose behind these underwater marine junk yards is to create artificial fish habitat where none existed before, and a number have been reported to be successful. The surprising fact is that, until early in 1961, there had been no scientific evaluations of their true worth.

The Maryland Department of Research and Education and the Magothy River Association have cooperated in a test of one of the many possible types of artificial reefs and in this case it failed to produce better fishing.

The study was conducted near the mouth of the Magothy River in Maryland from May through October 1960, using a paid angler to fish the experimental areas west of Gibson Island. The artificial reef was created by planting 700 bushels of oyster shells on a natural soft, muddy bottom and fishing here was compared to a nearby area on which no shells were planted.

In the course of the six-months experiment, 208 fishing trips, totaling 403 fishing hours, were completed with 906 fish caught over the reef and 1,166 fish caught over natural bottom.

The fisheries biologist who supervised the study tested fishing success against the popular Solunar Theory promoted by a nationally known outdoor writer. He found that the Solunar Tables were not successful in predicting the best fishing periods.

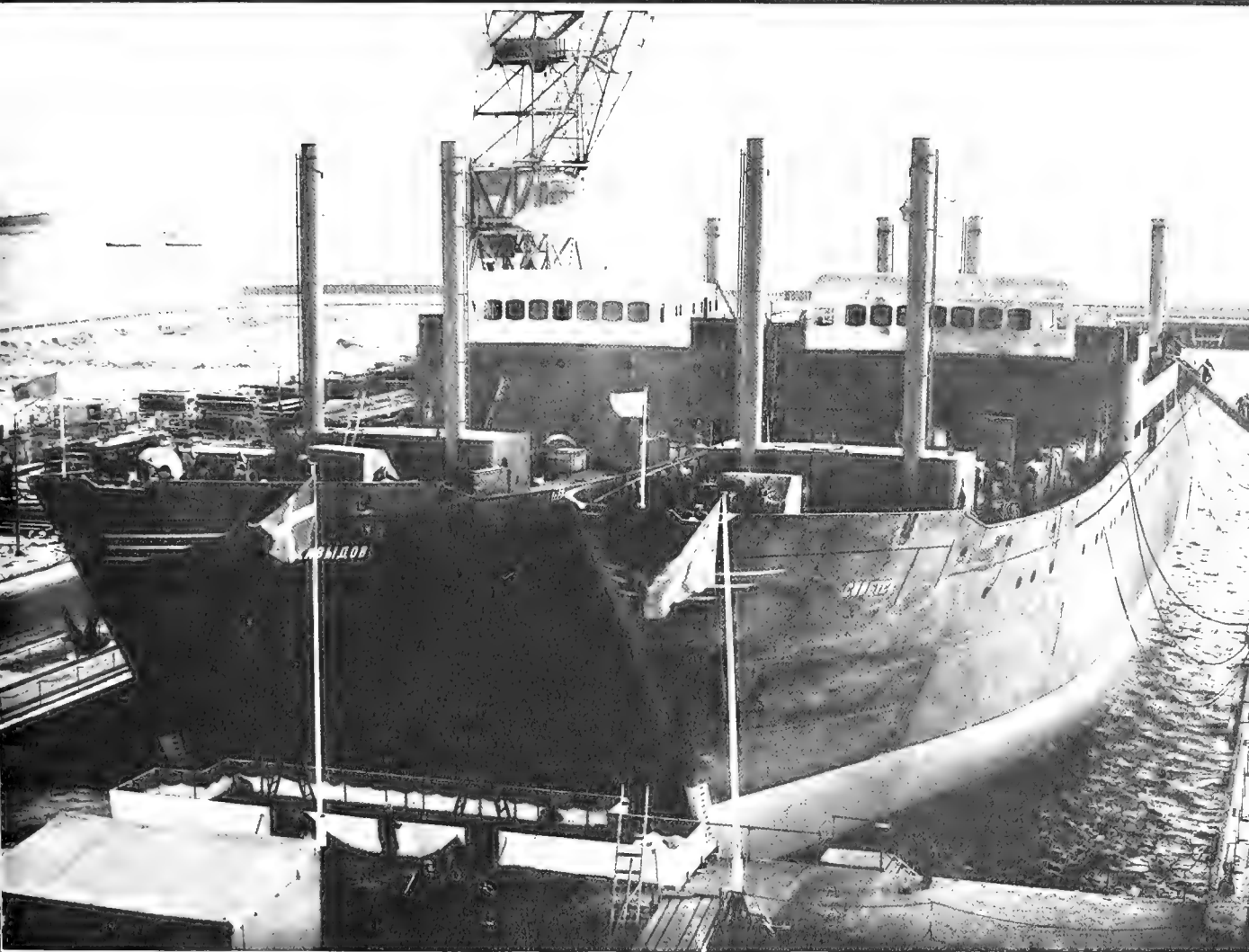
Commenting on the results of the study, the Director of the Department observed that creation of artificial reefs is quite costly and that thorough and careful research should precede expensive installations. He further stated that there are at least half a dozen ways that some of these reefs may affect fish and fishing, and that knowledge of the basic principles through research can help enormously in providing the best possible fishing at the lowest possible cost.

Although the reef did not improve the total catch of fish, the study produced other discoveries of interest to tidewater fishermen. Spot, pumpkinseeds, and toadfish were easier to catch over the reef, while white perch and brown bullheads favored natural bottom. More crabs were taken over the shell reef, and tide conditions made little difference in fishing success in either area. Best fishing came in the middle of the day, the best month for fishing was October, while June and July were the poorest. The best of the baits tested in the study was peeler crabs, with bloodworms, nightcrawlers, and clams in second place. Cut bait and shrimp were found to be poorest. (Maryland Department of Research and Education, Inland Resources Division, Annapolis, Md.)

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ROBERT H. GROSS JR.

COMMERCIAL FISHERIES REVIEW



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United States Department of the Interior
Washington, D.C.

ERRATA

Paste corrected masthead and contents page over page 1 of the February 1963 issue.

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Dr. Robert H. Gibbs, Jr.
Dept. of Biology
College of Liberal Arts
Boston University
128 D Boston 15, Mass.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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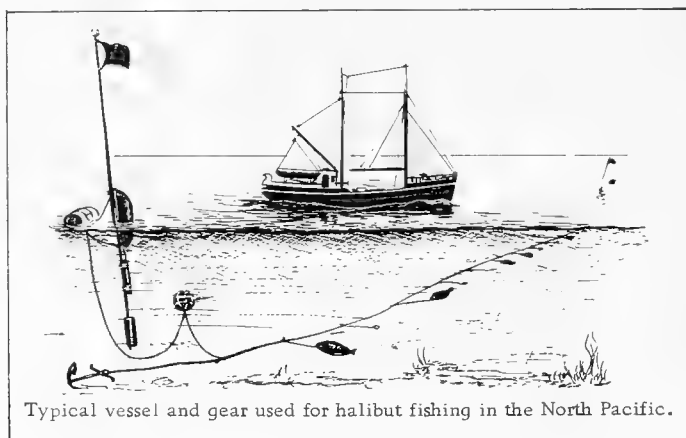
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Sr. Compositor: Alma Greene

Jr. Compositors: Dona K. Wallace and Marjorie McGlone

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A TRAWLING SURVEY OF SOUTHERN LAKE MICHIGAN (AUGUST-NOVEMBER 1960)

By William G. Gordon*

SUMMARY

Otter-trawl explorations in southern Lake Michigan were made in the latter half of 1960 by the U. S. Bureau of Commercial Fisheries. The fishing was carried out with vessels chartered from the Lake Michigan trawl fleet. Objectives of the investigation were to determine: commercial availability of fish to bottom trawls; seasonal distribution of the fish stocks; and the location and extent of areas suitable for fishing with conventional otter trawls.

A total of 134 otter-trawl drags was made at depths ranging from 5 to 45 fathoms around the southern perimeter of the lake from Ludington, Mich., on the east shore to Sturgeon Bay, Wis., on the west shore. Gear damage was light throughout the area. Weather and sea conditions were generally favorable.

Mixed catches of chubs, alewife, and smelt ranged as high as 1,200 pounds per 30-minute drag. Those fish were found most consistently at depths of 15 to 30 fathoms and dominated all catches. Yellow perch and whitefish were taken in limited amounts in drags at depths of less than 35 fathoms. Other fish of commercial importance were not taken in significant amounts.

INTRODUCTION

The traditional gill-net fishery of Lake Michigan has been in economic distress for the past several years. This condition developed as the more valuable species were reduced in number (primarily from sea lamprey depredation). The greatly increased populations of low-value species presently occupying the lake cannot be profitably harvested by gill nets. Progressive members of the fishing industry have sought ways of easing this situation through the development of more economical methods of production.

A limited trawl fishery for chubs, smelt, and alewife began in Wisconsin waters in 1958. It expanded to Indiana waters in 1959 and Michigan waters in 1960. Information regarding the commercial availability of chubs, alewife, smelt, suckers, and other underutilized fish was urgently needed before nearby industrial markets could be interested in developing uses for the fish. The fishing industry requested investigations to determine the seasonal distribution of fish stocks available to otter trawls and the location of suitable trawling bottoms.

The U. S. Bureau of Commercial Fisheries conducted 1-week exploratory cruises in August, September, October, and November of 1960. Systematic operations were conducted in predetermined areas and depths, with major emphasis on determining the depth distribution of the major chub species, alewife, and smelt.

*Fishery Methods and Equipment Specialist, Exploratory Fishing and Gear Research Station, U. S. Bureau of Commercial Fisheries, Ann Arbor, Mich.

DESCRIPTION OF AREA SURVEYED

The 1960 explorations were conducted along approximately 400 miles of the southern Lake Michigan shoreline from Ludington, Mich., to Sturgeon Bay, Wis., at distances of up to 35 miles offshore. For discussion, the area of coverage has been subdivided into east and west sections. A total of 135 trawl stations were established--66 in the eastern section and 69 in the western section (fig. 1). Depths fished ranged from $9\frac{1}{2}$ to 42 fathoms. Most attention was given to the 15- to 40-fathom depth range.

BOTTOM CONDITIONS

EASTERN SECTION: The eastern section includes Lake Michigan east of longitude 87° W. and south of Ludington, Mich. With few exceptions, the bottom is composed of fine sand near shore. The sand grades to clay and soft mud as the depth increases. The gradual slope and regular contours of the lake bottom in most of the section provide excellent trawling bottom. Irregular clay bottom, boulders, and sandy shoals generally occur only at depths of less than 10 fathoms, except north of Michigan City, Ind., where numerous detached shoals create unfavorable trawling conditions out to about 15 fathoms. A limited amount of good trawling bottom exists in depths shallower than 10 fathoms, as widely-scattered and not well-defined patches.

WESTERN SECTION: The western section of Lake Michigan includes the area west of longitude 87° W. and south of Sturgeon Bay, Wis. A band of boulder deposits and bedrock outcrops, extending outward along most of the shoreline to depths of 5 to 15 fathoms, creates unfavorable in-shore trawling conditions. The lake bottom beyond those depths consists mostly of sand, clay, or mud. Occasional patches of boulders and gravel impede trawling.

Although the slope becomes very steep in some places, the contours for the most part are regular, and trawling operations were carried out without difficulties. A number of snags were encountered on the steep slope off Sturgeon Bay, Wis.

South of Waukegan, the lake bottom inside the 15-fathom contour is dominated by rocky reefs and shoals. Little coverage was given to this zone because of the poor bottom and the presence of heavy shipping traffic.

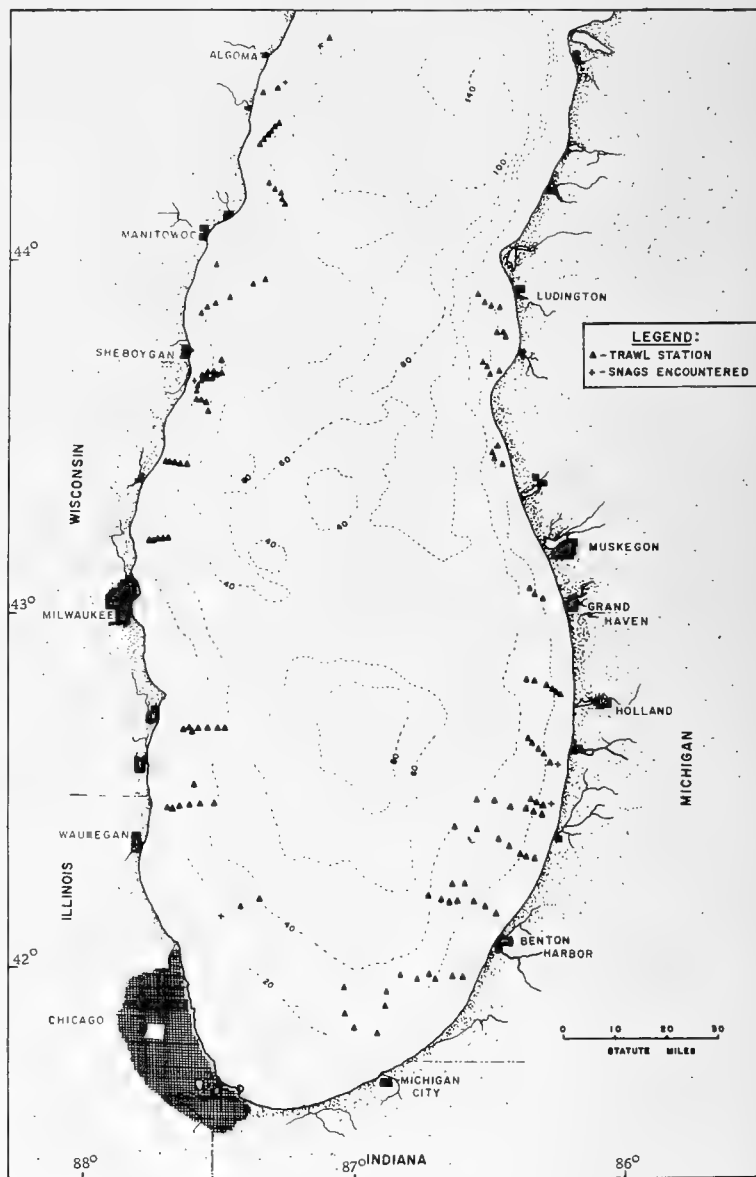


Fig. 1 - Geographic distribution of stations completed by the vessels Art Swaer II, Kevinbren, and Capitol I during 1960.

LAKE CURRENTS

Variations in force and direction of currents affect fishing conditions in much of the area studied. The long north-south axis of the lake intensifies the effects of strong southerly or northerly winds, and current velocities may, on occasion, exceed 3 m.p.h. Local wind force and direction and barometric pressure cannot always be correlated with observed current patterns. Since speed, direction, and duration of the currents are variable, a constant check is necessary to maintain desirable trawling speeds.

VESSELS USED

Three commercial trawlers were chartered by the Bureau for the four exploratory fishing cruises: the Art Swaer II (August); Kevinbren (September and November); and Capitol I (October). All are engaged in the recently established Lake Michigan trawl fishery.

M/V "ART SWAER II": The Art Swaer II, home port Pensaukee, Wis., was originally built as a Lake Erie gill-net vessel. The vessel was converted for trawling in 1960 (fig. 2) The all-steel vessel is 60 feet over-all, has a 16-foot beam, is powered by a 150 hp. Diesel



Fig. 2 - M/V Art Swaer II converted gill-net type vessel completed the first cruise of the research program.

engine, and is equipped with depth-sounder, automatic pilot, and radiotelephone. Unlike most converted United States gill-net vessels, the aft deckhouse was not removed. Deck machinery is driven from a main engine power take-off. The net is set out through the stern doorway and towed from two outrigger booms mounted on the mast. The catch is hauled through an enlarged doorway in the port side.

M/V "KEVINBREN": The Kevinbren, home port Milwaukee, Wis., was built in 1949 as a gill-net vessel for the Lake Michigan fishing fleet. It was rigged for trawling early in 1959 (fig. 3). This all-steel vessel has a total length of 57 feet and a beam of 14 feet. It is powered by a 165 hp. Diesel engine. Pilot-house equipment includes a depth-recorder, automatic pilot, and radiotelephone. The aft deckhouse has been removed. The deck machinery is driven by power take-off on the main engine. Arrangement of deck gear is similar to West Coast seiner-trawlers. The net is set and towed from the stern and the catch is hauled aboard over the starboard side.



Fig. 3 - M/V Kevinbren, a converted gill-net type vessel used during a part of the explorations.



Fig. 4 - M/V Capitol I, 55-foot, former shrimp vessel chartered for the operations along the southern end of Lake Michigan.

M/V "CAPITOL I:" The Capitol I, home port Saugatuck, Mich., was built in 1959 at Houston, Tex., as a double-rigged shrimp trawler. Brought to Lake Michigan early in 1960, it was converted to a conventional stern trawler by removing the double rig and installing stern davits (fig. 4). The all-steel vessel is 53 feet in length and has a 15-foot beam and a 7-foot draft. It is powered by a 165 hp. Diesel engine. Deck gear is driven by power take-off on the main engine. Electronic equipment includes a depth-recorder, radiotelephone, and automatic pilot. The net is handled over the stern, and the catch is hauled over the starboard side.

GEAR AND METHODS

Two-seam balloon fish trawls similar to those used in the Gulf of Mexico (Gordon and Brouillard 1960), with 50-foot headropes and 60-foot footropes were used exclusively during the explorations. Wings and body of each trawl were made of $2\frac{1}{4}$ -inch mesh^{1/} 18-thread cotton webbing, and the intermediate was made of $1\frac{1}{2}$ -inch mesh 15-thread cotton webbing. The cod end was made of $1\frac{5}{8}$ -inch mesh 42-thread cotton webbing. Round aluminum and oblong plastic floats were attached to the headrope. Chain weights were fastened to the footrope with 10-inch manila droplines. The trawl doors measured $2\frac{1}{2}$ by 7 feet and weighed about 120 pounds each. A later widening of the iron runners from 4 to 7 inches increased this weight to about 160 pounds.

For the first cruise the doors were fitted with chain-towing bridles; and dandyline gear (consisting of 20-foot extension straps from the wing tips) was attached directly to the back quarter of the door near the top and bottom. In the remaining three cruises, bar brackets were used rather than bridles, and the dandyline gear consisted of two 10-fathom legs connected to the door with conventional V-D (Vigneron-Dahl) gear.

The warp to depth ratio used was 3:1. Towing speed averaged about 3 m.p.h. Drags were 30 minutes long unless bottom obstructions were encountered.

FISHING RESULTS

CHUBS: Various species of deep-water ciscoes (table 1) dominated catches in both sections at depths of 15 to 45 fathoms. Best fishing was in 20 to 30 fathoms. Small chub, mostly "bloater" chub (*Leucichthys hoyi*) generally composed over 90 percent of the chub catch (fig. 5). The extreme northern and

Table 1 - List of Common and Scientific Names of Fish Caught During Botton Trawling Explorations in Southern Lake Michigan, August-November 1960

Common Name	Scientific Name
Longjaw cisco	<i>Leucichthys alpenae</i>
Herring	<i>Leucichthys artedii</i>
Whitefish	<i>Coregonus clupeaformis</i>
"Bloater" chub	<i>Leucichthys hoyi</i>
Kiyi chub	<i>Leucichthys kiyi</i>
Shortnose cisco	<i>Leucichthys reighardi</i>
Shortjaw cisco	<i>Leucichthys zenithicus</i>
Yellow perch	<i>Perca flavescens</i>
Alewife	<i>Alosa pseudoharengus</i>
Smelt	<i>Osmerus mordax</i>
Burbot	<i>Lota lota</i>
Emerald shiner	<i>Notropis atherinoides</i>
Spottail shiner	<i>Notropis hudsonius</i>
Sea lamprey	<i>Petromyzon marinus</i>
Sculpins	<i>Cottus</i> sp.



Fig. 5 - A catch of chubs made during the explorations. This 800-pound catch is typical of those made in productive areas.

^{1/}All mesh sizes in this report are stretched measure.

southern portions of the area covered were most productive, with chub catches averaging over 500 pounds per 30-minute drag. Chubs suitable for commercial smoking constituted 5 to 20 percent of the chub catch. These chubs ranged in size from 2 to 5 per pound.

ALEWIFE: Catches of alewife ranging from a few individuals to over 200 pounds per 30-minute drag were made in 10 to 30 fathoms. Best catches were obtained along the west shore at 20 to 25 fathoms.

The sporadic occurrence of alewife in the trawl catches indicates the possibility that commercial concentrations of this species may yet be located on other grounds or by mid-water fishing during more intensive explorations.

SMELT: Commercial quantities of smelt were caught at widely scattered points and depths along the west shore; catches along the east shore consisted of 15 pounds or less. Catches from the west section contained as many as 170 pounds of smelt (10 to 20 per pound) per drag in the 15- to 25-fathom depth range.

OTHER FISH: Several other fish of commercial importance were taken in small amounts at various localities and depths. Yellow perch were caught in small numbers in 31 drags inside 35 fathoms. Two drags northeast of Waukegan in 14-20 fathom resulted in catches of 40 and 70 pounds of yellow perch; fishing at the other positions produced perch in amounts not exceeding 10 pounds per drag. Whitefish were caught in amounts of 15 pounds or less per drag at depths less than 20 fathoms at scattered locations along the east shore. Lake herring were taken in amounts of 5 pounds or less in 47 drags at all depths fished.

A few fish, presently of no commercial importance, were caught in small quantities. These included: sculpin in amounts of 2 pounds or less; and spottail shiner (a small minnow), also in amounts of 2 pounds or less.

CONCLUSIONS

Exploratory trawling during the second half of 1960 has demonstrated that commercially important concentrations of underutilized fish are present in most of southern Lake Michigan inside 45 fathoms and that commercial catches can be made with otter-trawl gear in most of the area surveyed. Although obstructions were encountered, the bottom appears relatively clear outside 10 fathoms and for the most part can be considered trawlable. The size of the potential fishery resource, in terms of continuing yield, is unknown. Year-round exploratory work will be required before the seasonal distribution of the various species can be determined and before areas and depths of highest production are delineated. The preliminary study suggests that a considerable amount of gear research will be required to determine the most effective gear for catching the fish.

Since the areas fished are scattered, the survey must be considered preliminary. Possibly heavier concentrations of fish may be located in other seasons and on other grounds, or other fish of greater economic value may be located in other areas, depths, or midwater levels.

APPENDIX

A detailed fishing log showing position, depth, date, catch components, and related data for each drag made by the vessels used is available as an appendix to the reprint of this article. Write for Separate No. 667, which includes the tables (2-5) for the 1960 fishing logs for the Lake Michigan survey: Table 2 - M/V Art Swaer II Cruise 1, August 10-17; Tables 3 - M/V Kevinbren Cruise 2, September 7-13; and 5 - Cruise 4, November 16-21; and Table 4 - M/V Capitol I, Cruise 3, October 11-16.

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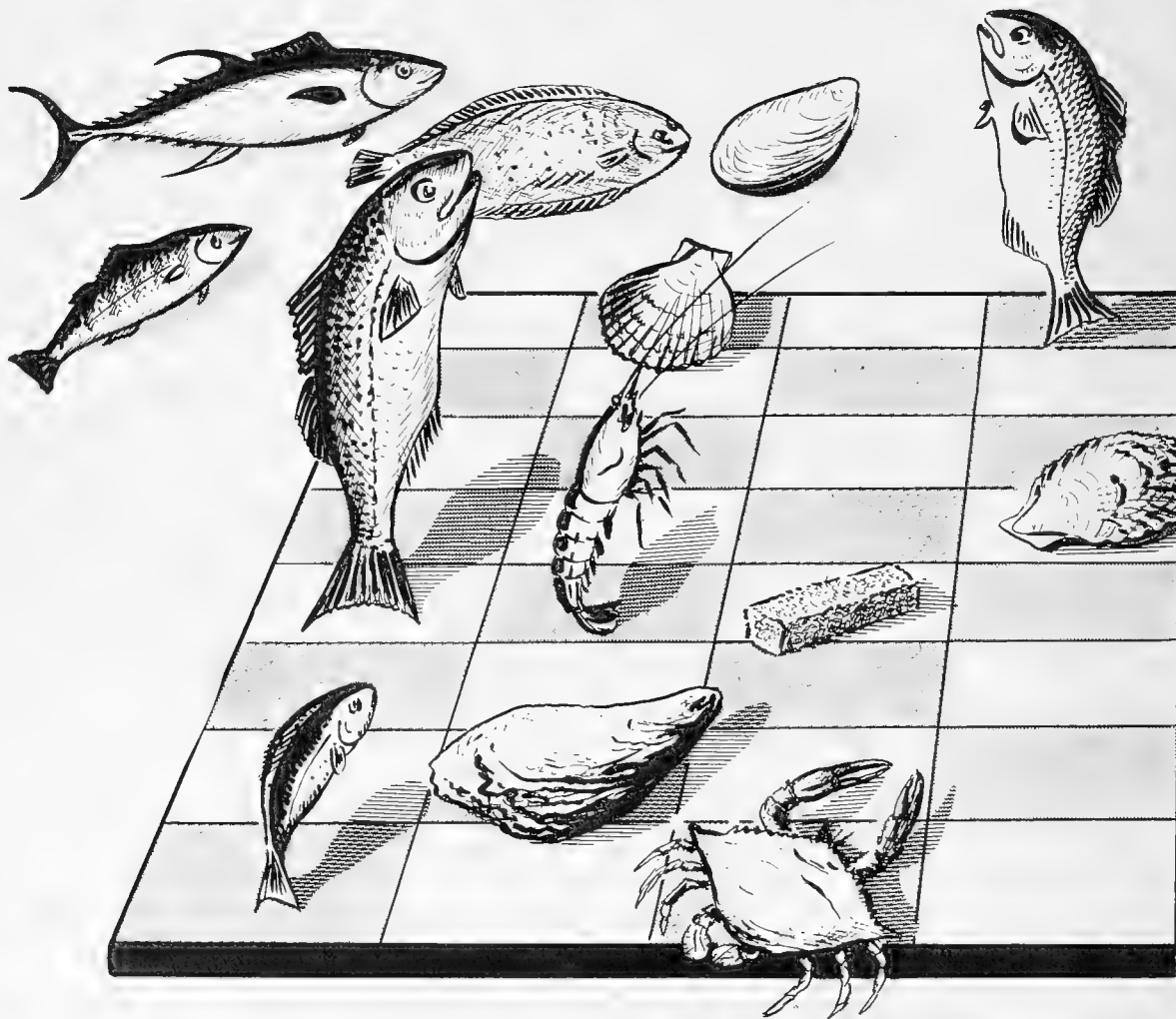
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Move to Better Meals Serve More



GULF STATES SHRIMP CANNING INDUSTRY

By F. Bruce Sanford*, Charles F. Lee**, and Travis D. Love***

Shrimp constitutes our most important fishery (table 1). This crustacean is sold frozen, canned, fresh, and dried. Frozen and canned shrimp bring the greatest revenue.

Table 1 - Value of the United States Catch, 1957-61					
Year	Shrimp	Salmon	Tuna	Other	Total
	(Million \$)				
1961	52	52	44	210	358
1960	67	45	37	204	353
1959	58	36	37	215	346
1958	73	46	45	210	373
1957	73	40	39	202	354

The shrimp canning industry is located in the Gulf and Pacific states (table 2). Most of the production is in the Gulf states, with Louisiana being the principal source.

Although consumers are aware of the tastiness and convenience of the canned product, many are not aware of the ingenuity and care required in its manufacture. Home economists, restaurateurs, retailers, and others closely associated with consumers may also not be acquainted with those aspects.

Table 2 - United States Canned Pack of Shrimp, 1961	
States	Value of Pack Million \$
Gulf:	
Louisiana	6.8
Mississippi	1.9
Alabama and Texas	1.0
Pacific:	
Alaska	1.8
Washington and Oregon	0.4
Total	12.0



Fig. 1 - Small shrimp trawlers find use primarily in the day-boat fishery. (The water plants seen here are water hyacinths, which grow profusely in many waterways of the South.)



Fig. 2 - Shrimp trawlers vary not only in size but also in design. The vessel in the foreground is a Florida-type trawler with the house well forward. The vessel in back is of the Biloxi type.

*Chemist-in-Charge, Branch of Reports, Seattle, Wash.

**Chemical Engineer, Fishery Technological Laboratory, College Park, Md.

***Laboratory Director, Fishery Technological Laboratory, Pascagoula, Miss.

The purpose of this article therefore is to report on the shrimp-canning industry in order to give an understanding of what is required to make canned shrimp available. Since the operations are somewhat complex for a verbal description, photographs are used to depict the various steps.



Fig. 3 - Many of the larger trawlers are double-rigged so that they can drag two trawls simultaneously. Note the two pairs of trawl doors hanging from the rigging, one pair on each side of the vessel.

U. S. Bureau of Commercial Fisheries.

U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
SEP. NO. 668



Fig. 4 - Shrimp and ice are shoveled from the hold into a conveyor-hopper. Depending on the location of the plant and on circumstances, shrimp are brought to the plant by either vessel or truck.



Fig. 6 - The shrimp are passed over an inspection belt, where debris and cull shrimp are removed.

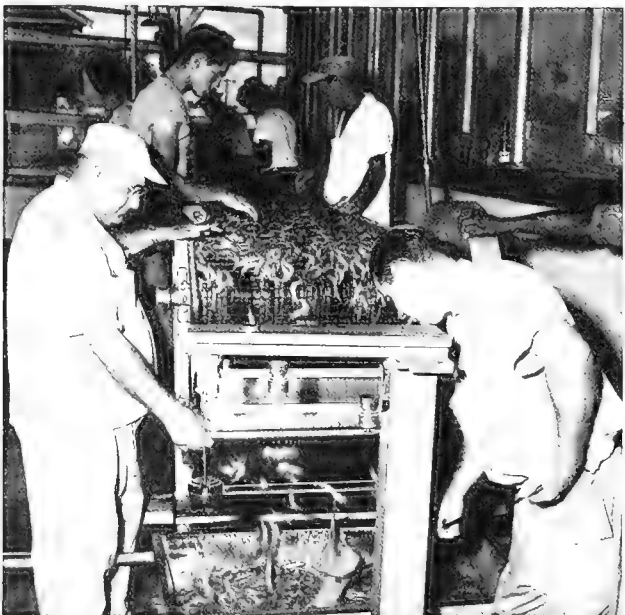


Fig. 8 - The inspected shrimp are conveyed to a weighing basket, which holds 105 pounds or a half barrel of shrimp.



Fig. 5 - Ice is separated from the shrimp, and the shrimp are washed prior to being conveyed into the plant.

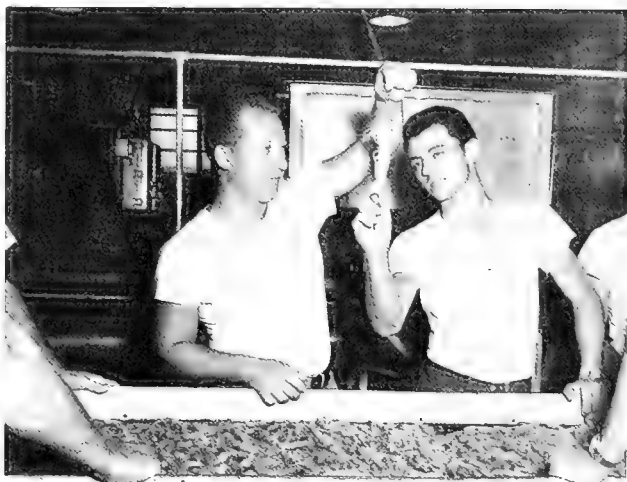


Fig. 7 - Shrimp may grow to large size.

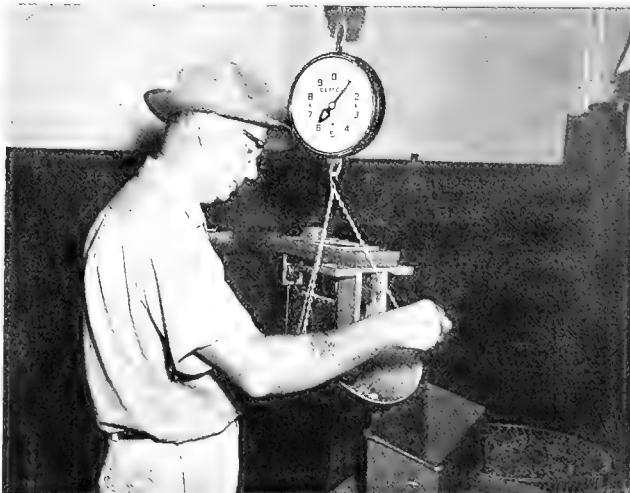


Fig. 9 - Since the price paid to the vessel for shrimp varies with the size, random samples are counted to determine the average number of shrimp per pound.

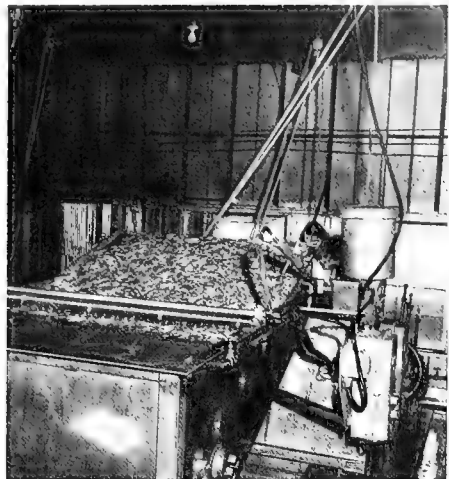


Fig. 10 - Shrimp are dumped into the hopper in the foreground and are carried by conveyor into a peeling machine.

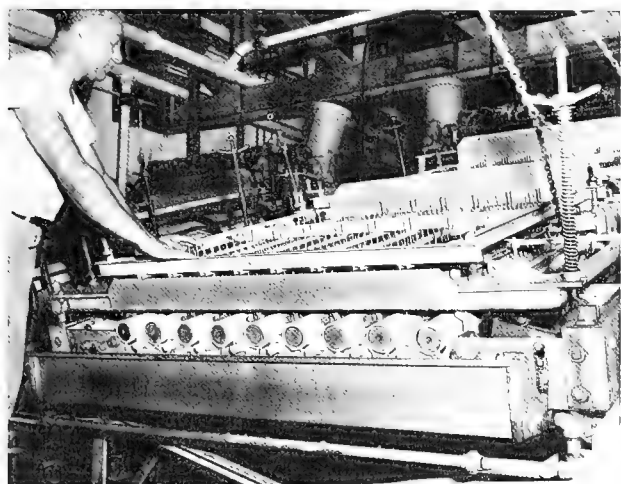


Fig. 12 - Alternately rising and falling mechanical fingers gently apply pressure to hold the shrimp against the soft rubber-covered rollers. A flow of water and the force of gravity carry the shrimp downward to the trough at the bottom end of the machine.

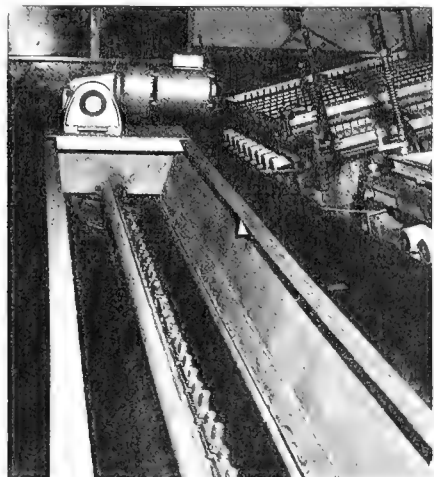


Fig. 14 - From the peeler, the shrimp pass to a scrubber, where an eccentric cam rotates rollers over the shrimp to loosen any material not removed in the peeler.

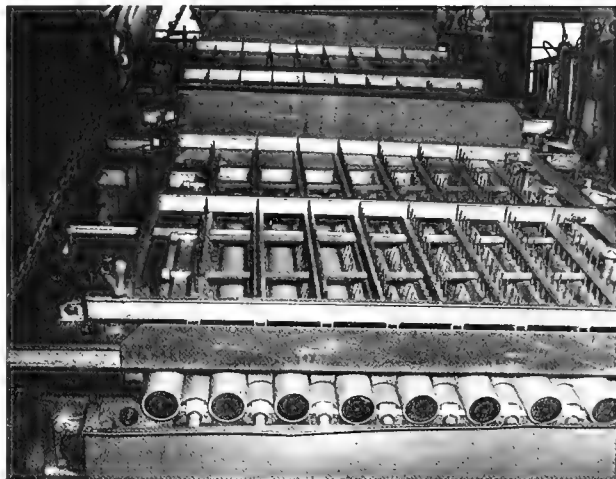


Fig. 11 - An oscillating motion of the rubber-covered rolls of this mechanical peeler assists in separating heads and shell from the softer meats of the shrimp.

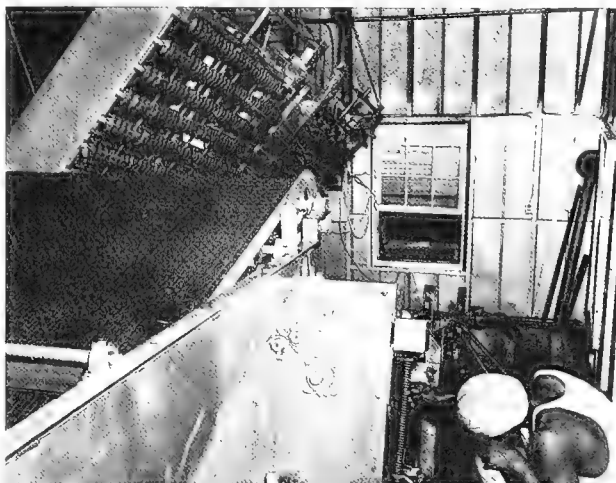


Fig. 13 - The opened machine shows the specially designed fingers that position the shrimp against the oscillating rollers for peeling.

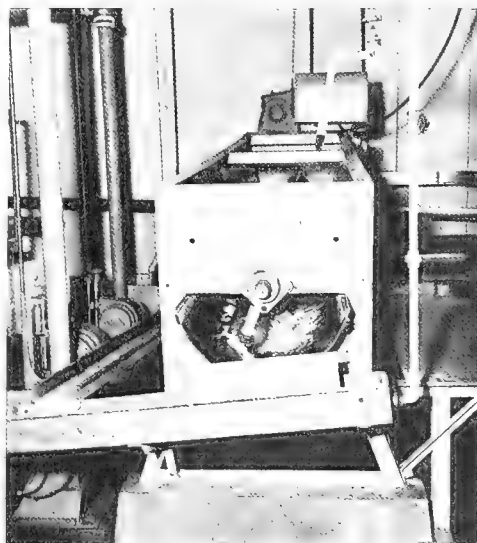


Fig. 15 - This view of the scrubber shows the rollers oscillating rapidly back and forth in a trough of running water.

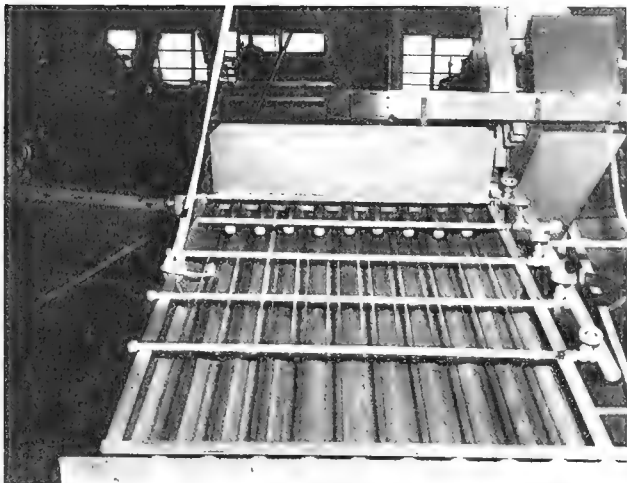


Fig. 16 - A separator removes the final bits of material loosened by the scrubber.

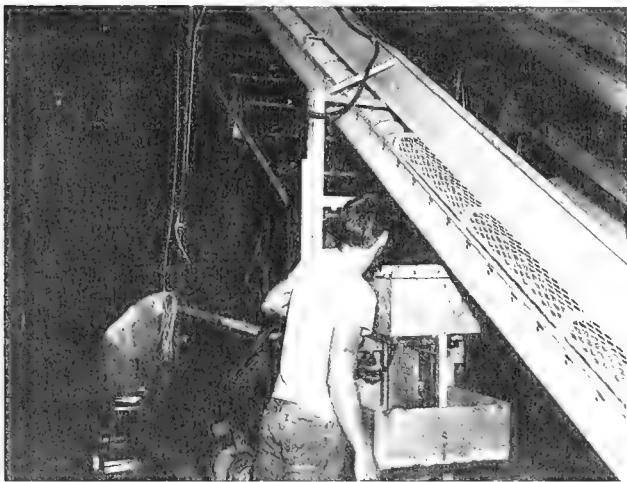


Fig. 18 - A screw conveyor elevates the shrimp to the top of the machine.

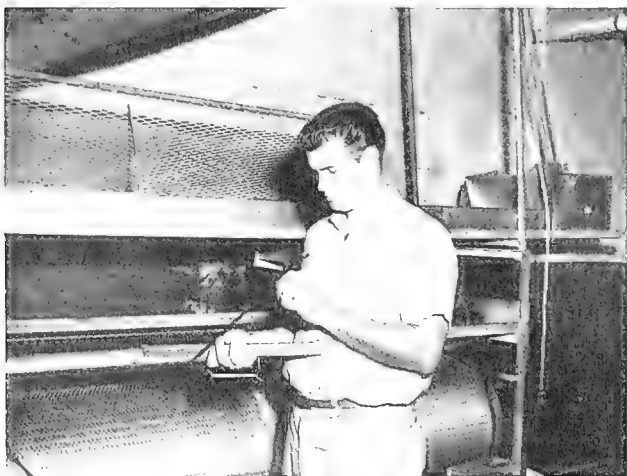


Fig. 20 - A special razor blade is used in the deveining machine.

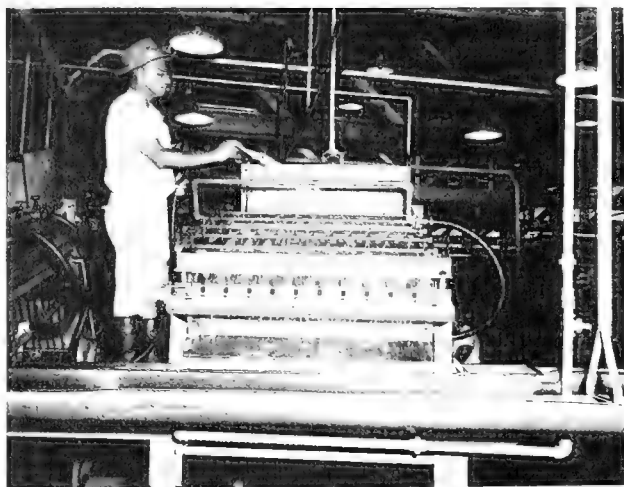


Fig. 17 - The shrimp drop from the end of the separator into a flume that transfers them to a deveining machine.

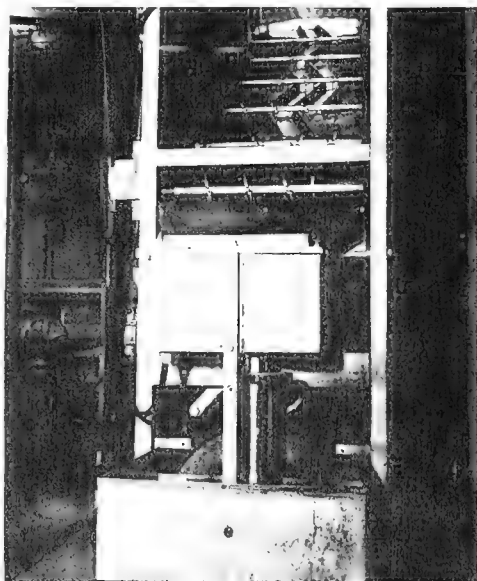


Fig. 19 - This machine removes the sand vein from the shrimp. The device has razor-sharp knife edges on the upper baffles to cut the back muscle of the shrimp in such a manner that the sand vein can be removed in the bottom rotating drum by sharp projections on its inner surface.

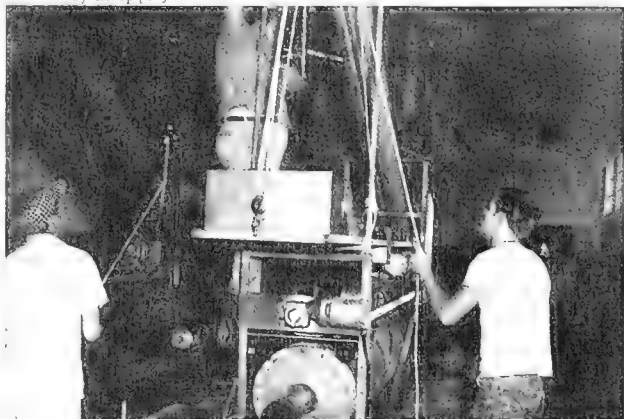


Fig. 21 - The angle of descent on the deveiner is adjustable.

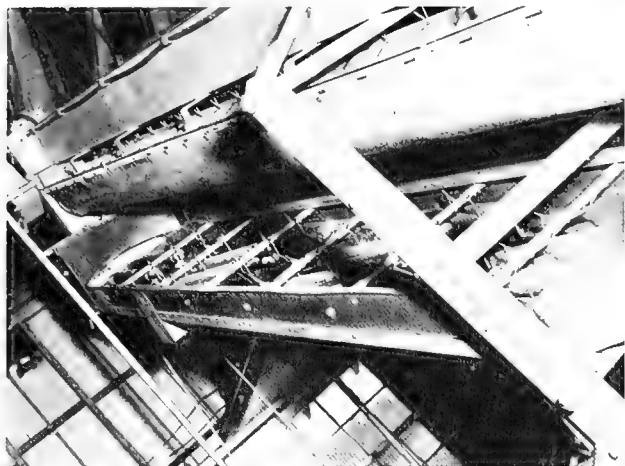


Fig. 22 - The shrimp are carried past the blades by a flow of water and the force of gravity.

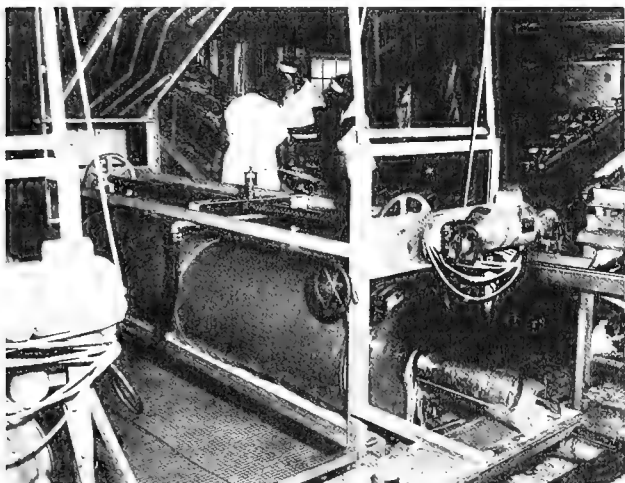


Fig. 24 - A carriage mounted on a screw supports a pressure hose that travels to an fro, washing the sand veins from the drum.

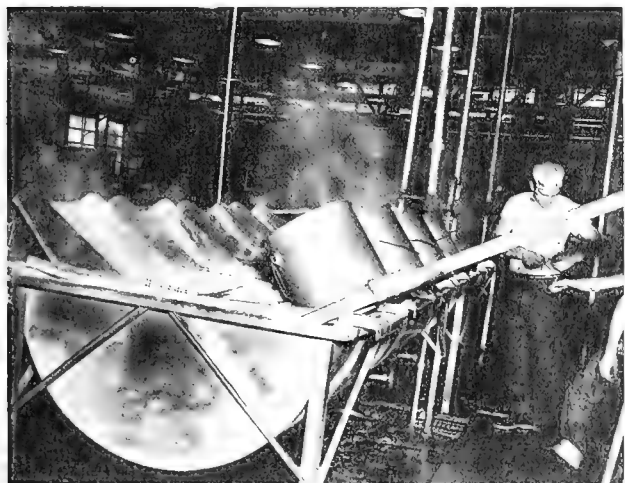


Fig. 26 - The cooking is done in a salt solution. Shown here is a batch cooker.

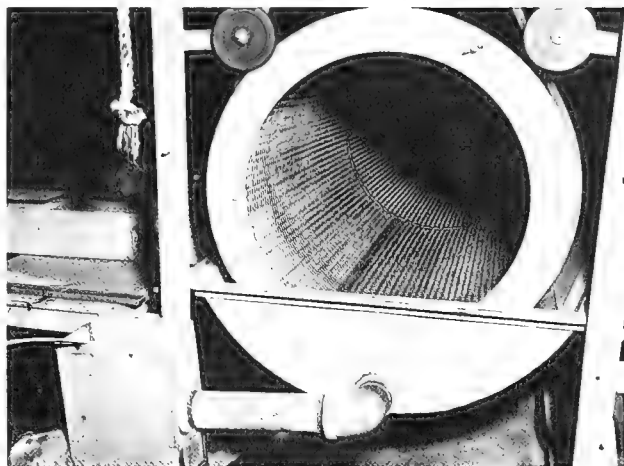


Fig. 23 - This is a view of the interior of the rotating drum for removing the sand vein.



Fig. 25 - The shrimp are inspected prior to being cooked.

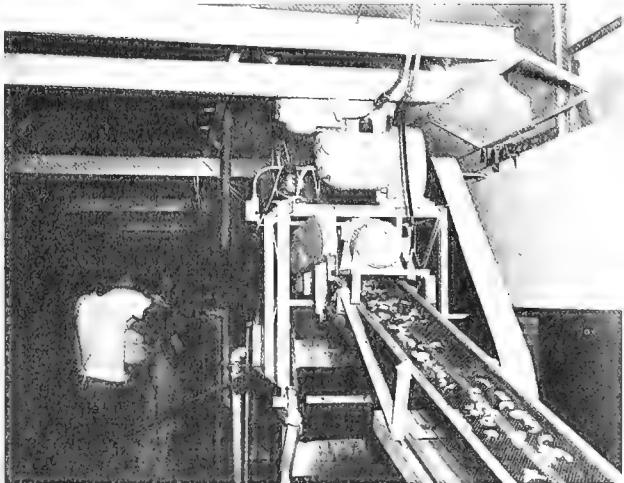


Fig. 27 - Alternately, a continuous cooker may be used.

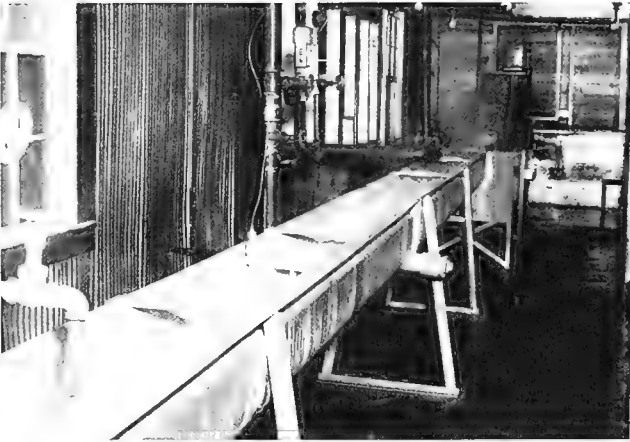


Fig. 28 - A rotating screw advances the shrimp through this cooker.

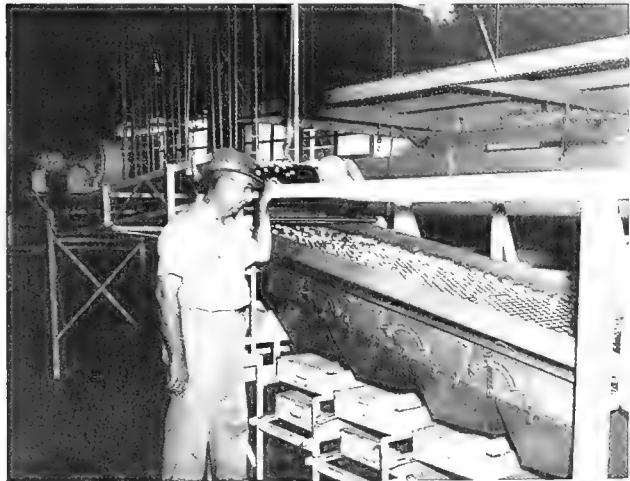


Fig. 30 - The shrimp are sized mechanically into the following groups: tiny, small, medium, large, jumbo, and colossal.

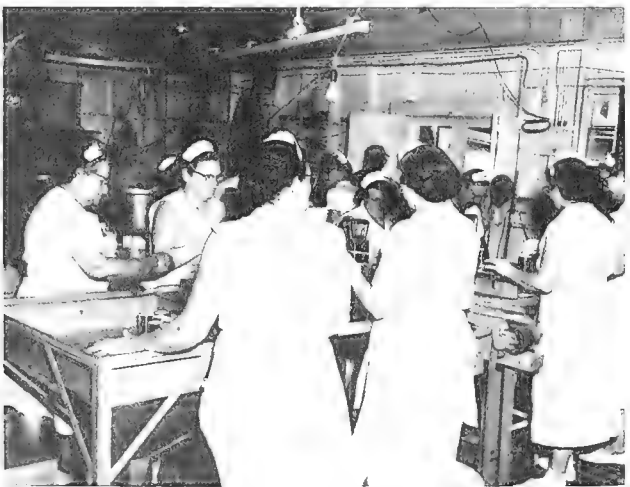


Fig. 32 - The cans are weighed by hand in order to meet the close tolerances required.

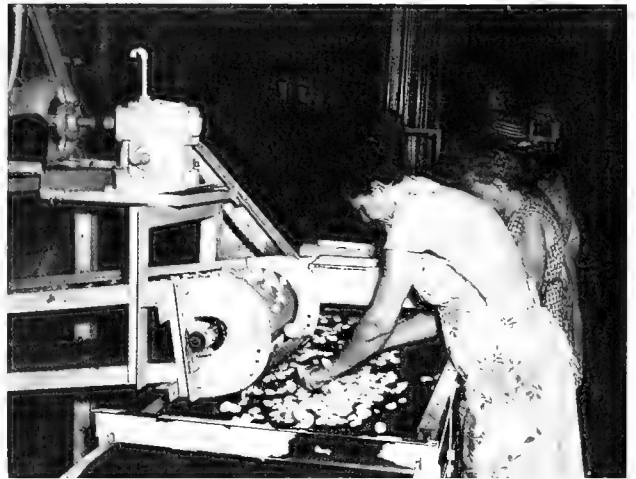


Fig. 29 - When the shrimp have been cooked, they are again inspected. After having passed through the cooker, they develop an attractive pink color and a characteristic curl. This curled shape not only is attractive, but use is made of it later in the mechanical grading of the shrimp for size. Also it is necessary to remove a portion of the moisture in order to get the proper amount in the can for required drained weight cut-out.



Fig. 31 - Broken shrimp are separated from the perfect ones.



Fig. 33 - The scales are designed for quick weighing.

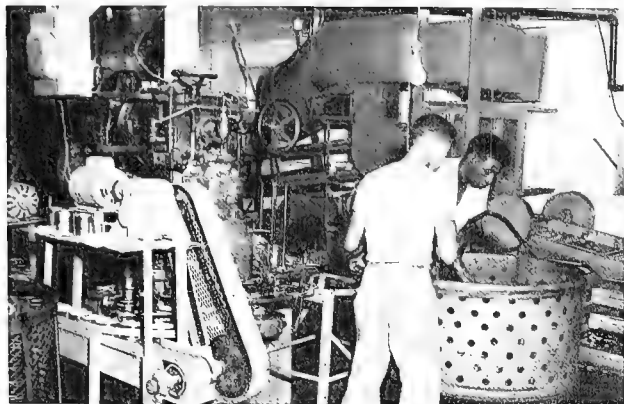


Fig. 34 - The cans are filled with a hot salt solution and are automatically sealed by machine. The salt solution, being hot, ensures a vacuum when the cans are cooled.

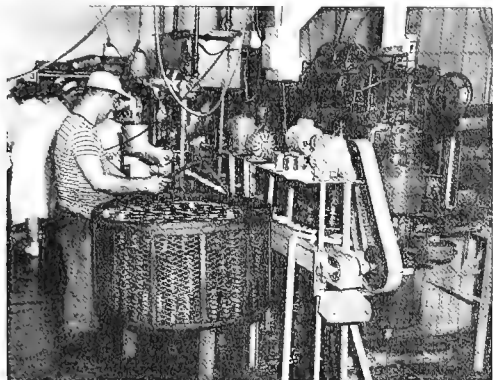


Fig. 36 - Use of a dolly permits the basket to be moved easily.

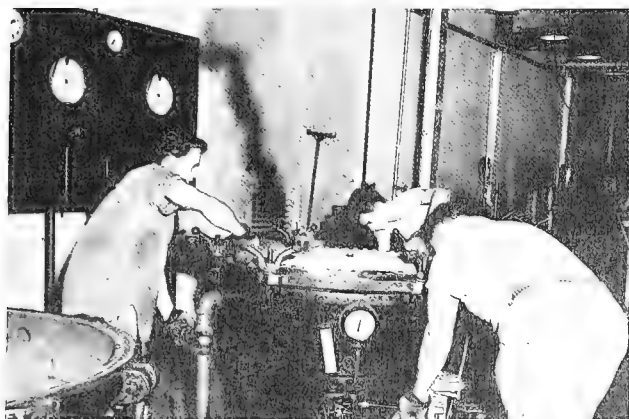


Fig. 38 - A cook is started in the retort, which holds the desired pressure automatically. Time, temperature, and pressure are recorded on the charts shown on the upper left.



Fig. 40 - The cans of cooked shrimp are immersed in cooling water. Cooling prevents the shrimp from becoming overcooked.

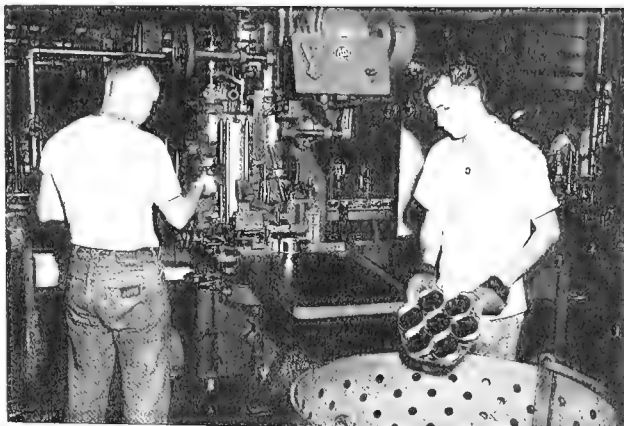


Fig. 35 - From the sealer, the cans go into a retort basket.



Fig. 37 - The basket is lifted into the retort with a power hoist.

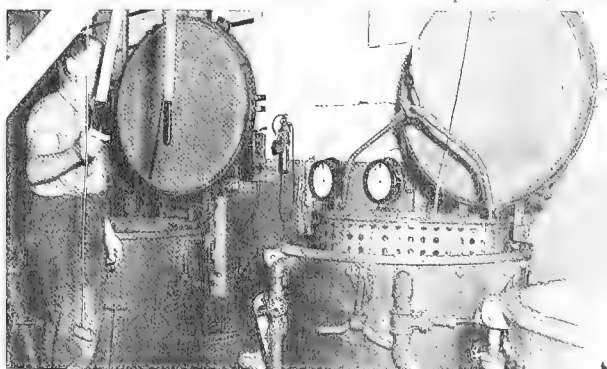


Fig. 39 - The power hoist again comes into use in removing the basket from the retort.



Fig. 41 - The processed cans are removed from the retort basket.



Fig. 42 - The unlabeled cans may be cased for storage, depending on the orders at hand.



Fig. 44 - At the end of day, the machinery is carefully greased.

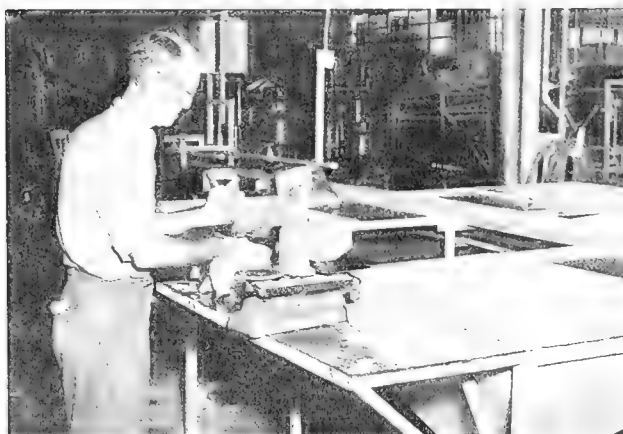


Fig. 46 - Each piece of equipment is cleaned carefully.



Fig. 43 - After the cans have passed through a labeling machine, they are packed into cartons ready for shipment to the consumer.



Fig. 45 - The equipment and the plant are thoroughly scrubbed with detergents and chlorine.

As the photographs show, the visitor to a plant for canning shrimp is impressed by the ingenuity and the care used in manufacture. Machines perform operations that persons unacquainted with American inventiveness would not think possible. Quality, however, is not left to mechanical devices: the product is inspected and reinspected in every step in the process. Utmost vigilance is used to ensure that every can of shrimp will be perfect.

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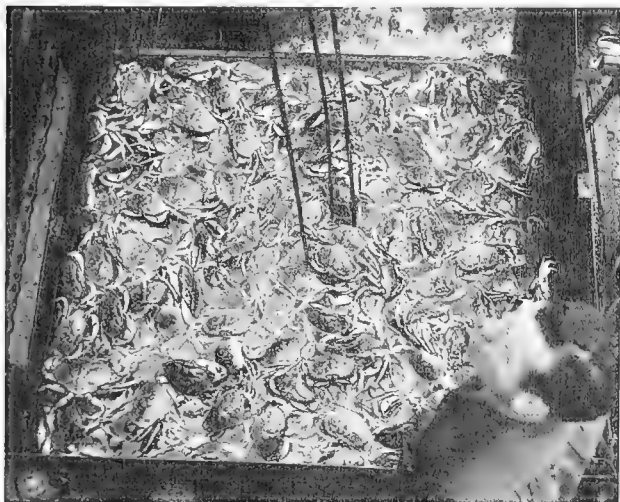
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TRENDS AND DEVELOPMENTS

Alaska

NEW DUNGENESS CRAB OPERATION IN SOUTHEASTERN ALASKA:

A new Dungeness crab operation began in November 1962 at the village of Metlakatla. A company has been formed to process and ship fresh Dungeness crab meat to Seattle by



Lively dungeness crabs in a live well aboard a crab fishing boat.

air freight. Several boats from the village salmon fleet have been equipped with crab pots, but landings in November were small because of bad weather and inexperienced fishermen. Current plans are to fish the bays and inlets in the Ketchikan-Prince of Wales Island area and to avoid the more exposed waters of Dixon Entrance and Hecate Strait.

* * * * *

HERRING IN GOOD ABUNDANCE IN SOUTHEASTERN ALASKA:

Although the single herring reduction operator in Southeastern Alaska took 14,000 tons of herring in the 1962 season, which was about half of the 1961 catch, the catch per unit of effort measured in boat-ton days was 1,340 pounds, the second highest since 1929.

The 1958 year-class formed 80 percent of the catch taken in 1962.

* * * * *

GAINS SEEN IN 1962 CATCHES OF SEVERAL FISHERIES:

Alaskan fishermen have caught more salmon and halibut in 1962 than they did in 1961.



Fig. 1 - Brailing red salmon from gill net boat to buying scow in Bristol Bay.

It is apparent that record catches of king crab, shrimp, and probably Dungeness crab will have been taken when final data are available. On the basis of the reported pack of canned salmon, it has been estimated that the 1962 catch of salmon in Alaska totaled approximately 280 million pounds--15 million pounds more than in 1961. In 1962, the catch of halibut in Alaska totaled approximately 36 million



Fig. 2 - Shrimp being transported from landing dock to processing plant.

pounds (round weight), while in 1961 the catch was 33.4 million pounds. It is estimated that the catch of king crab in Alaska will top 50 million pounds; the record 1961 catch totaled 43.4 million pounds. The 1962 catch of Dungeness crab is expected to surpass the record catch of 5.5 million pounds taken in 1951. A catch of approximately 25 million pounds of shrimp in 1962 will exceed the record 1961 catch by about 9 million pounds.



Alaska Fisheries Investigations

The following is a report of the November-December 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska.

CONVERTED OCEANOGRAPHIC VESSEL:

The Murre II is the latest tool adopted by the Biological Research Laboratory, Auke Bay, in its expanding oceanographic program in Alaska. The vessel completed its initial cruise, and during November analysis of data collected was begun.

The Murre II is a self-propelled power barge 86 feet long with a 24-foot beam. She is powered by twin caterpillar Diesel engines and will do 8 knots. The vessel is equipped with living accommodations for 9 people and 2 laboratories, one approximately 10 by 15 feet and the other about 8 by 16 feet. There are about 720 square feet of usable forward deck space, with limited working space on the stern.

The objectives of the Laboratory's oceanographic program for the first 2 or 3 years will be to conduct reconnaissance surveys of certain areas of Southeastern Alaska known to be important nursery grounds and migration routes of commercially valuable fish and shellfish and to describe the dominant properties of those marine environments.

* * * * *

PINK SALMON EGG MORTALITY IN LITTLE PORT WALTER:

A field party traveled to Little Port Walter aboard the vessel Heron in early November to continue observations on the abundance of



Enumerating pink salmon fry on their outmigration at Sashin Creek, Little Port Walter, in Southeastern Alaska.

dead 1961 brood-year pink salmon eggs in the Sashin Creek spawning beds at Little Port Walter. A sizable number of dead 1961 brood eggs equal to the number observed in mid-August was still present in late October, and plans are being made to sample again in the spring of 1963 to determine if 1961 brood-year eggs are present at that time. Large numbers of decomposing residual eggs in the spawning gravel could result in excess mortalities among the eggs of the next brood year.

Such a decrease in salmon productivity would argue for more accurate determination of optimum numbers of spawning fish and avoidance of overescapement as well as underescapement.

* * * * *

KING CRAB TAGS RECOVERED IN SHUMAGIN ISLAND AREA:

Only about 15 tags were collected in the Shumagin Island area, partly due to the limited fishery there. In contrast to the Kodiak king crab fishermen, fishermen in the Shumagin Islands and Alaska Peninsula areas are primarily salmon fishermen. Therefore, those king crab stocks are not as extensively fished as they are in the Kodiak area.

* * * * *

RECORD MIGRATION DISTANCES FOR SALMON REVEALED IN YUKON RIVER STUDIES:

Studies conducted by the Bureau in connection with the proposed Rampart Canyon project have resulted in the discovery of salmon migration unparalleled on the North American continent. In the Yukon River, the chinook or king salmon travel as far upstream as Nesutlin Lake in Yukon Territory, Canada, a distance of some 2,000 miles.

Chum or dog salmon have been observed at Teslin Lake in Yukon Territory, a distance of 1,735 miles from salt water. Only in the Amur River of Siberia are chums known to approach such far-distant movement to reach their spawning areas. Normally, chum salmon spawn relatively close to salt water. Because of the Yukon River chum's adaptation to this long distance migration journey, those chums are extremely fine fish, the meat being very deep orange in color and having a high content of oil to sustain the fish on the extended journey.

Cohos or silver salmon pass the proposed damsite beginning in late September, and apparently finish their ascent to the spawning areas under the ice during the winter months. Cohos tagged near the damsite in October have been recovered in December as far upstream as Old Crow, Yukon Territory, some 1,600 miles above the mouth of the Yukon. Reliable reports from Indians of Old Crow, located north of the Arctic Circle, indicate that cohos spawn in spring areas during February, an

additional 200 miles further upriver than the recovery point of tagged fish.

In the 1962 agreement between the Department of the Army and the Department of the Interior it was agreed that the Department of the Interior shall initiate, in cooperation with the State of Alaska and interested Federal agencies, broad comprehensive studies of the effect of the Rampart project on all natural resources. This study shall be completed prior to any recommendations for authorization of the Rampart project. Preliminary discussions have been held with personnel of the Bureau of Reclamation District Office in Alaska, who have been assigned the responsibility of compiling and assembling this report for the Department.

* * * * *

EXPERIMENTS TO INFLUENCE RED SALMON CHOICE OF HOME STREAMS:

Experiments are proceeding at the Bristol Bay-Brooks Lake Station whereby sockeye salmon are subjected to morpholine which is being continuously introduced into Hidden Creek during the egg and fry stages. It is anticipated that this same chemical may be used to influence their choice of home streams when they return to spawn as adults. This will be tested by discontinuing morpholine in Hidden Creek and introducing it instead into a neighboring tributary. In the low winter temperatures, freezing of morpholine in certain pipe connections at the metering site on Hidden Creek required modifications of the butane heating system; however, the project in December was operating smoothly. If adult salmon runs can be attracted to other than their ancestral streams in this manner, a valuable management and research technique will be available.

* * * * *

OLSEN BAY PINK SALMON EGG LOSS HIGH FROM OVERSPAWNING:

The exceptionally high pink salmon spawning run into the research stream at Olsen Bay in 1962 resulted in a loss of eggs after the maximum numbers successfully deposited had been reached. In the early stages of the run where there was little or no competition for space and the females could defend their redds, there was a fairly close agreement between actual and potential egg deposition. When the accumulated number of eggs buried

in the spawning bed reached approximately 3,600 per square meter, additional spawners started to dislodge as much as two-thirds as many eggs as they successfully deposited. The maximum number of eggs which were successfully deposited was about 4,200 per square meter. After all spawning had been completed, the number of eggs per square meter was about 3,300. While the loss of 900 eggs per square meter is attributed largely to the excess spawning activities, some flooding did occur and accounted for some of the losses.



American Fisheries Advisory Committee

COMMITTEE ASKS EFFORT TO MEET WORLD FISHERIES COMPETITION:

Five steps which would help American commercial fishermen meet the competition of foreign fishing fleets were outlined by the American Fisheries Advisory Committee at its meeting in Kansas City, Mo., in December 1962, the Department of the Interior reported on December 19.

The 20-member Committee was established in 1955 under the Saltonstall-Kennedy Act and includes leading representatives of the commercial fishing industry from all parts of the Nation. It advises the Secretary of the Interior on fishery matters.

Steps outlined by the Committee were:

1. Increased scientific and economic research of fisheries.
2. More authority for international commissions in fish management and harvesting.
3. Modernization of United States fishing vessels and shore installations to equal those of competing nations, vessel loans, grants, and mortgage insurance where such programs apply.
4. Improvement of production and marketing techniques to build a better knowledge of fishery products and better markets.
5. Development of untapped resources which exist in tremendous quantities.

Among other problems which were discussed at the three-day meeting (December 3-5) were the effects of pesticides on fish life, grading and inspection of fishery products, development of new fishing gear, and the importance of mid-America to the fishing industry as a major market for fishery products.

Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, opened the meeting by asking the committee to consider carefully the international implications involved in the conservation of the living resources of the sea.

Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, emphasized the political and economic impact which the European Economic Community, the Trade Expansion Act, and other major domestic and international developments are likely to have on this Nation's commercial fisheries consistent with yield.

Membership of the American Fisheries Advisory Committee includes Ammon G. Duntun, White Stone, Va.; J. Roy Duggan, Brunswick, Ga.; Thomas D. McGinness, Irvington, Va.; Roy Prewitt, Lonoke, Ark.; Ralph E. Carr, Kansas City, Mo.; Harold F. Cary, Long Beach, Calif.; Chris Dahl, Petersburg, Alaska; George J. Davidson, Boston, Mass.; Louis Fischer, Cocoa, Fla.; Ray H. Full, Vermilion, Ohio; H. R. Humphreys, Jr., White Stone, Va.; Leon S. Kenney, St. Petersburg, Fla.; E. Robert Kinney, Gloucester, Mass.; John S. McGowan, Astoria, Oreg.; James McPhillips, Mobile, Ala.; John Mehos, Galveston, Tex.; Arthur H. Mendonca, San Francisco, Calif.; Anthony Nizetich, San Pedro, Calif.; Einar Pedersen, Seattle, Wash.; and Daniel H. Smith, Port Washington, Wis.

The next meeting will be in Washington, D. C., May 27-29, 1963.



California

PELAGIC FISH POPULATION SURVEY CONTINUED:

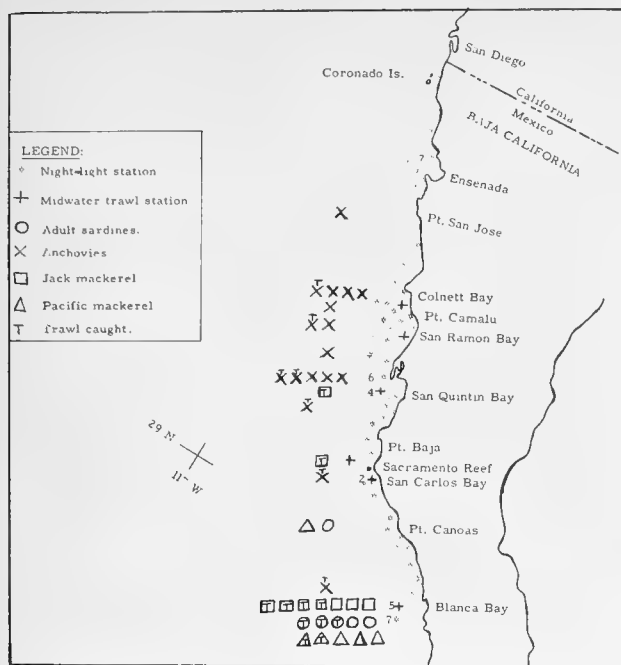
M/V "Alaska" Cruise 62-A-6-Pelagic Fish (October 10-November 6, 1962): The coastal waters off the Pacific Coast of northern Baja California from Blanca Bay to the Coronado Islands were surveyed by the California Department of Fish and Game research vessel Alaska. The objectives were (1) to assess the strength of the 1962 sardine year-class and to determine the population density and distribution of adults; (2) to survey other pelagic

A Comparison of Trawl Catches with Light Station Catches from the Same Area

Area	Fishing Method	Station Number	Pacific Sardine	Northern Anchovy	Pacific Hake	Jack Mackerel	Pacific Rockfish	Pacific Round	Pacific Perch	Jack Smelt	Pacific Herring	California Barracuda	All Other Fish ¹	Total
Blanca Bay	Trawl	I*	1			77								
		II*	2		9	4							2	1
		III		500				19					2	
		IV	255		4	2		2					32	
		V				1				16	150		11	7
	Light	1	500		2	88								
		2						5						
		3												
		4	17		2	4		400						
		5												
San Carlos	Trawl	VI*										220		
	Light	VII		4 tons										
Sacramento Reef	Trawl	VIII*				1							18	20
San Quintin Bay	Trawl	IX*												
		X		500									5	
		XI		1,500	46					2			2	
		XII		3 tons										
		27		5										
	Light	28												
		29												
		30												
		31												
		32		6,000										
San Ramon Bay	Trawl	XIII*		300									8	
	Light	40												
Colnett Bay	Trawl	XIV		200									1	
	Light	47		3										
		48												
		49		1										100

*Denotes daytime trawl, all others were made at night.

¹"All other fish" includes bat ray, California lizardfish, kelp pipefish, ocean whitefish, white croaker, queenfish, halibut, humphead, sharpnose seaperch, Pacific sandbar, California halibut, fantail sole, spotted turbot, humphead turbot, slim midshipman, and stargazer.



M/V *Alaska* Cruise 62-A-6-Pelagic Fish (October 19–November 6, 1962).

species for distribution, abundance, and age composition; (3) to continue testing a midwater trawl as a sampling device for pelagic species; and (4) to obtain live juvenile sardines for growth and scale studies.

The 1962 sardine year-class appeared to be very weak in the area. Fish-of-the-year were not observed or sampled at any of the 80 night-light stations occupied. Adult fish were absent except south of Pt. Canoas (see chart) where 3 samples were taken. Two of those were collected in Blanca Bay and were in the same size range (187–204 mm. or about 4.7–5.2 inches) as those found there on the previous cruise. The third sample was taken during daylight hours at Pt. Canoas. Several schools were seen there at sundown, but none was attracted to the night light.

No sardine schools were observed during 370 miles of night scouting. The sardine population in 1962 appears to be the lowest on record.

Northern anchovies were distributed over much of the survey area. They were present on 10 of 80 light stations and were taken in 7 of 14 midwater trawls. Twenty-seven schools were observed while scouting at night. Heavy local concentrations were present at San Carlos Bay, Pt. Camalu, Colnett Bay, and

Pt. San Jose. Sizes ranged from pinheads (70–100 mm. or about 1.8–2.5 inches) to very large adults (130–144 mm. or about 2.5–3.3 inches). The pinhead size and an intermediate group (115–125 mm. or about 2.9–3.2 inches) comprised the bulk of the samples.

Jack and Pacific mackerel were unusually scarce. Four Pacific and 3 jack mackerel samples were collected at night-light stations in areas where sardines were also found.

Two additional samples of jack mackerel were caught by midwater trawling off Sacramento Reef and in San Quintin Bay. No school of either species was observed while night scouting.

Bonito were distributed over almost the entire survey area. They were most abundant in the area from Ensenada to the Coronado Islands where 39 schools were observed.

In order to compare night-light blanket net catches with midwater trawl catches, 2 daytime and 3 nighttime 45-minute surface tows were made at Blanca Bay, then 7 night-light stations were occupied at various points along the trawl tracks on the succeeding night. Pelagic species caught with the trawl included sardines, Pacific mackerel, jack mackerel, anchovies, and round herring. The night trawls produced better catches than the day trawls in number of species and quantities of fish.

The blanket net caught relatively larger catches of sardines and all pelagic fish investigation project species except anchovies. The trawl caught a great many more other species, especially bottom forms.

Trawling was conducted at various other locations along the cruise track, generally within 10 fathoms of the surface. Catches consisted almost entirely of anchovies and corresponded quite well with night-light station catches in the same vicinity. A notable exception was at San Carlos Bay, where the heaviest concentrations of anchovies were found. A 20-minute night trawl loaded the net so heavily the cod end burst, but night-light stations located directly over these fish failed to attract them. A surprising trawl catch of 220 adult barracuda was made in this same area during daytime. One deep tow (100 fms.) for hake over the edge of the continental shelf off Sacramento Reef failed to produce deep water species.

Thus far, the trawl appears to sample anchovies more consistently than the blanket

net used with a night light. It was felt previously that cruises have grossly undersampled that species because they are frequently negatively phototactic.

Excellent weather prevailed during almost the entire cruise. Sea surface temperatures ranged from 66° F. at Pt. Canoas to 57° F. at Pt. Baja.

Airplane Spotting Flight 62-12-Pelagic Fish (November 15-16, 1962): The survey to determine the inshore distribution and abundance of inshore pelagic fish schools from the United States-Mexican Border to Santa Cruz, Calif., was continued by the Department's Cessna "182" 9042T.

On November 15, 1962, the area from Point Sal to Santa Cruz, Calif., was surveyed. Eighteen anchovy schools were sighted off Cayucos and 14 in San Simeon Bay. Four anchovy schools were counted in Monterey Bay: 2 off Santa Cruz and 2 about 2 miles off the Salinas River. Twelve unidentified schools were close to shore about 2 miles north of Monterey. Despite the scarcity of fish schools, birds were quite active and a few porpoises were present in the middle of the bay.

On November 16, 1962, the coastal area from the United States-Mexican Border to Pt. Conception was surveyed. The only fish seen were 10 unidentified schools off Pt. Loma.

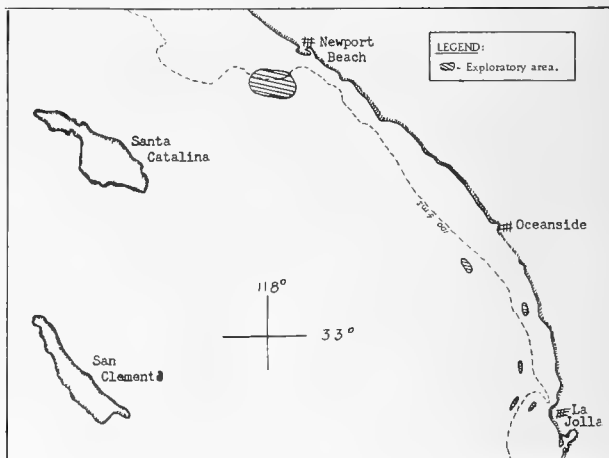
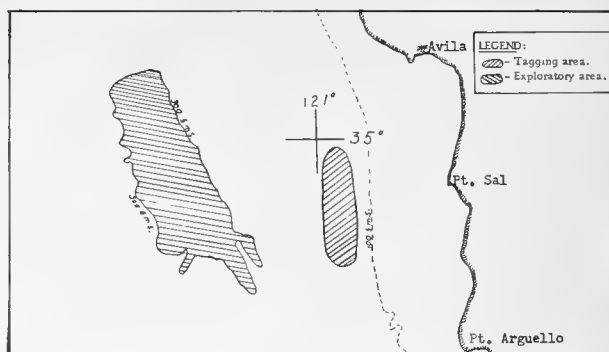
There were small amounts of red tide in Monterey and Santa Monica Bays, and also off Long Beach and Oceanside. The brightest red tide was below Point Loma; in October 1962 the highest intensity was around the Long Beach and Port Hueneme areas. In September 1962 it was brightest in Monterey Bay.

Note: See Commercial Fisheries Review, December 1962 p. 22, November 1962 p. 18, October 1962 p. 11, August 1962 p. 15, July 1962 p. 12, May 1962 p. 14.

* * * * *

PETRALE SOLE TAGGING AND BOTTOMFISH SURVEY OFF SOUTHERN CALIFORNIA:

M/V "N. B. Scofield" Cruise 62-S-7-Trawl (October 9-November 9, 1962): The offshore waters between La Jolla and Newport Beach, Calif., were surveyed for concentrations of bottomfish, and petrale sole were tagged in deep-water offshore from Pt. Sal by the California Department of Fish and Game research vessel N. B. Scofield.



Cruise (62-S-7-Trawl) of the research vessel N. B. Scofield to tag petrale sole and survey offshore areas for bottomfish.

Between October 11 and November 4, 1962, 350 petrale sole (Eopsetta jordani) were tagged off Pt. Sal in 110 to 190 fathoms, mostly in 170 to 190 fathoms. The fish were tagged with vinyl spaghetti-type tags.

Two days were spent tracking the Pt. Sal area, and one, 1-hour tow was made at 300 fathoms, which yielded approximately 45 pounds of Dover sole (Microstomus pacificus), 50 pounds of sablefish (Anoplopoma fimbria), and small amounts of other species.

Twelve tows were made in Newport Beach area from 70 to 300 fathoms. The most predominant species were English sole (Parophrys vetulus), Dover sole, rex sole (Glyptocephalus zachirus), sablefish, and green-spotted rockfish (Sebastes chlorostictus).

Two tows were made in the Oceanside area: one at 50 and the other at 250 fathoms. Each tow was of 30 minutes duration. No significant poundage of fish was taken in either tow.

In the La Jolla area three tows were made at 50, 200, and 250 fathoms. No significant

catches of any species were made at any of the three stations. The area in 50 fathoms was unsuitable for trawling.

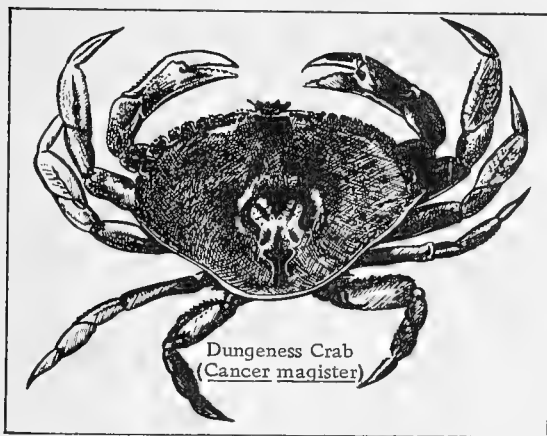
Great numbers of sea urchins (*Allocentrotus* sp.) were taken in each of the four trawling areas (from 25 to 150 pounds per tow). They were especially abundant off Newport Beach.

Note: See Commercial Fisheries Review, July 1962 p. 13, and March 1962 p. 21.

* * * * *

PRESEASON SAMPLING OF DUNGENESS CRAB POPULATION OFF CENTRAL CALIFORNIA INDICATES ANOTHER POOR SEASON:

M/V "Nautilus" Cruise 62-N-2j (October 16-November 7, 1962): To sample the pre-season population of Dungeness or market crabs (*Cancer magister*) was the principal objective of this cruise. A secondary objective was to determine size, sex ratios, and condition of crabs from different areas. The cruise was made by the California Department of Fish and Game research vessel Nautilus in the coastal waters off central California from Point Montara to the Russian River.



According to the survey, the California biologists believe the catch for the 1962/63 season will be between the 1961 season's catch of 687,000 pounds and the 1960 season's take of 2,300,000 pounds. Adjustment of those figures by percentages indicates total 1962/63 landings will fall between 728,000 and 1,600,000 pounds.

Sampling stations were selected randomly from the crabbing areas between Point Montara and the Russian River. Fifty 40-inch commercial-type crab traps, without escape ports, were fished in 10 to 40 fathoms of water.

A string of 10 traps was baited with rock-fish carcasses and squid and allowed to fish overnight at 71 stations, except at 6 stations strings were not pulled for 48 hours and one string fished 64 hours because of bad weather and vessel trouble.

In all, 5,508 crabs were taken in the traps, 2,844 legal-size males, 2,545 sublegal-size males, and 119 females. The average legal catch per trap of 4.1, was only slightly higher than the 3.2 legal-size crabs per trap taken in 1961 when San Francisco fishermen had their worst year on record for the area. The sublegal-size catch of 3.52 per trap was down from 1961 so the picture is not bright for the San Francisco crab fishermen.

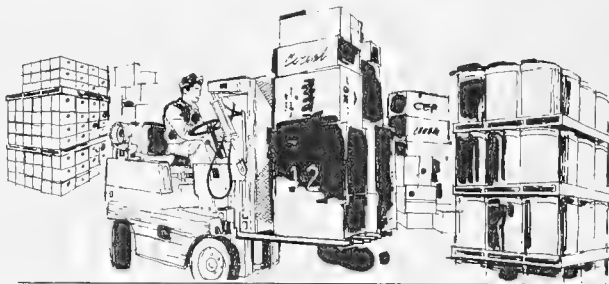
The catches were scattered over the entire area in waters generally 10 to 30 fathoms deep. The best catch however, was in 34-37 fathoms off Point Reyes and averages 28 legal-size crabs per trap. Other deep-water sets were not as productive.

Note: See Commercial Fisheries Review, October 1962 p. 9.



Cans--Shipments for Fishery Products, January-October 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-October 1962 was 7.5 percent above that used during the same period in 1961. Before 1962, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.



A total of 2,680,088 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first ten months of 1962, whereas in the same period of 1961 (when only tinplate was reported 2,493,931 base boxes of steel were consumed.

The increase was due mainly to larger packs of Maine sardines, shrimp, salmon, and tuna during 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches equivalent to 112 sheets 14"x20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.



Central Pacific Fisheries Investigations

FEEDING BEHAVIOR OF SKIPJACK TUNA STUDIED:

M/V "Charles H. Gilbert" Cruise 62 (November 26-December 18, 1962): The main purpose of this cruise by the Charles H. Gilbert, research vessel of the U.S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, was to capture and bring back live tuna for use in the Laboratory's research on the behavior, sensory powers, and learning ability of these commercially-valuable and often elusive fish. The cruise was conducted in the vicinity of the Island of Oahu and did not exceed a 65-mile radius from Honolulu.

The biologists succeeded in bringing back unusually good numbers of several tuna species, all of them extremely sensitive fish which literally die at the slightest touch. By using delicate handling technique developed by the Laboratory and by making many trips back and forth between Kewalo Basin and the fishing grounds, the vessel delivered alive to the shoreside behavior study tanks 13 aku (oceanic skipjack), 61 kawakawa (little tunny), 18 ahi (yellowfin tuna), and 13 frigate

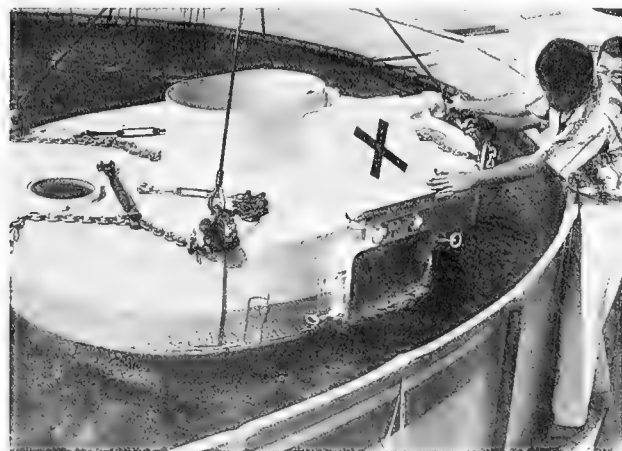


Fig. 1 - Portable skipjack tank in pool of U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

mackerel (*Auxis thazard*). These fish were immediately subjected to intensive tests and observations, because their survival in captivity is unpredictable and has never been of more than a few months' duration at best.

While fishing for live tuna specimens was in progress the biologists aboard the vessel took the opportunity to study through underwater observation ports in the vessel's hull

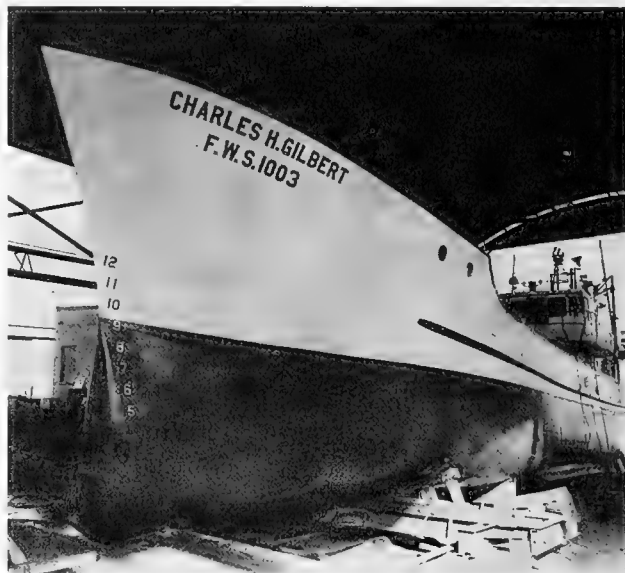


Fig. 2 - Underwater observation chamber in bow of research vessel Charles H. Gilbert.

the feeding behavior of skipjack. The live bait used to bring the tuna in to the fishermen's hooks included both nehu (the common Hawaiian tuna bait fish) and tilapia (used with surface water sprays) from the State's bait-raising plant, so the scientists were able to observe the reactions of the skipjack to two different kinds of prey.

The studies are designed to compare the feeding behavior of skipjack when (1) two different species (nehu and tilapia) are used as bait and (2) surface water sprays are used with tilapia as bait.

The behavior of skipjack as they fed alternately on nehu and tilapia was recorded on movie film on three occasions. The size range of the skipjack was different in each of the experiments: 22-40 cm. (8.7-15.7 inches), 50-62 cm. (19.7-24.4 inches), and 60-71 cm. (23.6-28.0 inches). Skipjack of the smallest size group were accompanied by yellowfin tuna and of frigate mackerel of similar sizes.

Many of the tuna caught on the cruise failed to survive to be placed in the Laboratory's tanks, and from 98 of the skipjack which did not, blood samples were taken for typing. The results will be used in the Laboratory's Pacific-wide investigation of the distribution and relationships of tuna subpopulations and particularly the problem of how many different populations of skipjack contribute to the Hawaiian commercial fishery.

The watch for bird flocks and fish schools resulted in 28 sightings of which 6 were skipjack; 1 mixed skipjack, yellowfin, and frigate mackerel; 2 little tunny; 1 mixed little tunny and frigate mackerel; 1 porpoise; and 17 unidentified.

A writer with the U. S. Naval Photographic Center in Washington, D. C., boarded the ship for one day on November 28 to collect material for a script on oceanographic research in the United States.

The first right gill arches of 56 skipjack, 13 little tunny, and 6 frigate mackerel were collected and frozen for the behavior program.

* * * * *

SEASONAL AVAILABILITY OF HAWAIIAN SKIPJACK TUNA MAY BE PREDICTED FROM STUDIES OF OCEANOGRAPHIC CLIMATE:

Oceanographic research at the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries has shown that the Hawaiian oceanographic climate is primarily determined by seasonal changes in surface water movement. During spring and summer California Current Extension water spreads northward into the Hawaiian Islands, displacing the higher salinity North Pacific Central water. This process is reversed in later summer and fall when the California Current Extension water retreats southward and higher salinity water returns to the islands. The timing and intensity of these water movements are reflected in the monthly changes of sea surface temperature and salinity which are regularly measured at Koko Head, Oahu.

It has always been suspected that seasonal changes in the trade wind system were the cause of the seasonal surface water movements, however, not until an investigation of the time-sequence temperatures and salinities from Koko Head was made, was it possible to associate changes in the trade wind system

with those ocean processes. Recently a preliminary analysis was made of the monthly mean sea level pressure charts in terms of the location of the center of trade wind action and the strength of the trade wind system. This indicated that during the period of northward displacement of the California Current Extension water the center of wind action was located over the California Current Extension. During the period of southward displacement, the center was located over the North Pacific Equatorial system. Onset of northward and southward movement coincided with the change of location of the center of trade wind action.

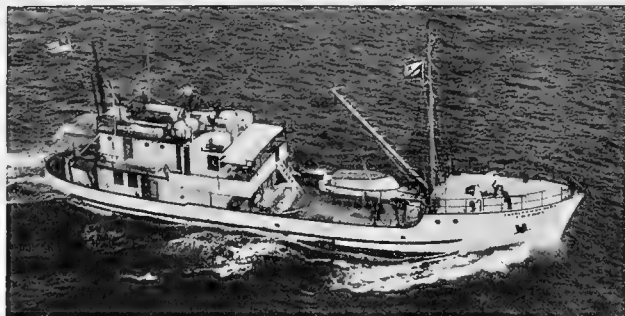
It also became apparent that the strength of the system, an index combining the geostrophic (defective force due to rotation of the earth) wind speed with the size of the system, is a more important parameter than trade wind speed alone. Maximum strength of the trade wind system occurs during July and August and minimum strength during December and January, which is in phase with maximum and minimum surface water motion as reflected by the Koko Head temperature data. Maximum and minimum wind speeds, on the other hand, do not coincide with the maximum and minimum intensity of surface water movement.

If these relationships found in the average situation hold during a forthcoming investigation of individual years, then important progress will have been made in gaining understanding of the linkage mechanism between wind action and surface water motion in the Hawaiian region. It will also make possible prediction of season skipjack availability in Hawaiian waters directly from weather charts. This prediction is presently based on the time of initial heating at Koko Head.

* * * * *

RESEARCH VESSEL SCOUTS FOR SKIPJACK TUNA EAST OF HAWAII:

A search for skipjack tuna (aku) in a new area and with new fishing methods was initiated on January 10, 1963, by the U. S. Bureau of Commercial Fisheries Honolulu-based research vessel Charles H. Gilbert. This cruise, to which the name Boundary I has been given, will take the ship to the vicinity of 150° W. long., about 450 miles east of the Hawaiian Islands, in an area which Bureau scientists consider likely to be the winter range of the skipjack tuna schools which



Research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries.

support a productive summer fishery in Hawaiian waters.

The "boundary" for which the cruise is named is the division between two important water types of the central Pacific, the California Current Extension, and the North Pacific Central water. Studies carried out around the Hawaiian Islands during the summer fishing season have indicated that skipjack schools are numerous in the vicinity of this boundary. This cruise is aimed at discovering whether this is also true in winter, when the boundary lies to the east and south of the Islands. The scientists will find the location of the boundary by measuring the salt content of the ocean surface water and will then fish in the boundary and to the north and south of it to discover how it is related to the abundance of skipjack.

Fishing for skipjack tuna, both commercially and for scientific sampling, is generally done with pole-and-line and live-bait, and the research vessel will carry in her bait tanks a supply of the hardy tilapia for the purpose. However, because the area to be surveyed is so far from base and because of the duration of the cruise (almost 2 months), it will not be possible to rely entirely on live-bait fishing. Therefore, the vessel's crew will fish for skipjack with tuna long lines, similar to those used in Hawaiian waters for catching large tuna and marlins, but with hooks and bait more suited to the smaller skipjack. A small-scale long line of the type used for salmon fishing in the northwestern Pacific will also be tried out.

One of the main purposes of sampling skipjack tuna east of Hawaii, in addition to that of gaining information on the relation of the fish to water types, is to collect specimens of blood for typing. Examination of the blood types will reveal whether the skipjack tuna found along the boundary in winter are members

of the population which supports the Hawaiian summer fishery or another population.

Many fishery scientists believe that the skipjack tuna offers the greatest production potential of all the tuna species. Although many thousands of tons of this small tuna are taken by the existing fisheries off Hawaii, Japan, and the Central and South American coasts, there is evidence that the yield could be greatly increased if more efficient ways of discovering and capturing the schools could be devised. Recent indications that yellowfin tuna production in the eastern Pacific is nearing its natural limits have heightened the United States fishing industry's interest in the skipjack tuna resource, an interest that is reflected in the present cruise of the Charles H. Gilbert.



Composition of Fishery Products

NEW METHOD FOR DETERMINING PHOSPHORUS IN FISHERY PRODUCTS:

Evaluation of methods of phosphorous determination are under study by the U. S. Bureau of Commercial Fisheries Laboratory at Seattle, Wash., because of the existing need for a more rapid and accurate method for determination of phosphorous in fishery products. The studies and research have resulted in the discovery of a new method.

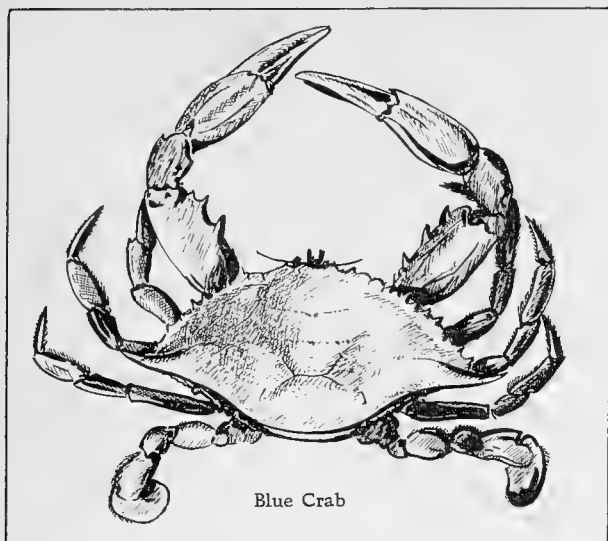
The new method involves burning a fishery product sample in an oxygen-filled flask containing dilute nitric acid, which absorbs the gases upon boiling. The phosphate is then determined colorimetrically. The total time required for phosphorus determination is now less than one-half hour. This is quite a substantial improvement over the old method which was time consuming (taking many hours), and even less accurate.



Crabs

LOW BLUE CRAB CATCH PREDICTED IN CHESAPEAKE BAY FOR 1962/63 WINTER:

Despite the fact that the first week's crab dredge catch was good early in December 1962, the quantity of blue crabs in the Chesapeake Bay during the 1962/63 winter was still considered to be small. Dredge boat catches until

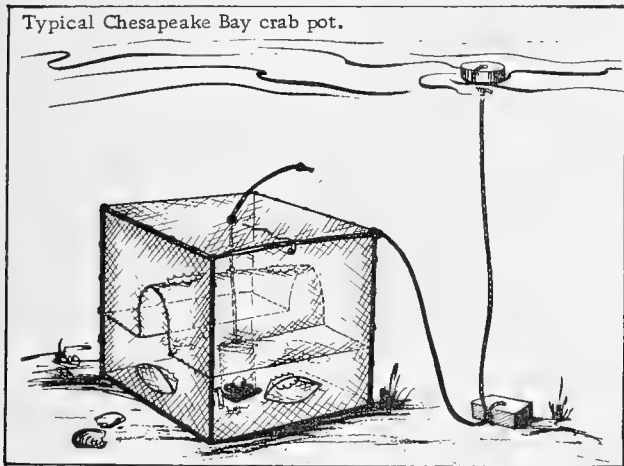


Blue Crab

the end of March should be much below average, according to biologists of the Virginia Institute of Marine Science, Gloucester Point, Va. An average catch, based on more than 30 years of records, would be about 11 barrels of crabs a day. While catches up to the boat limit of 30 barrels per day have been made by many dredgers since the opening of the dredge season December 1, catches were expected to decline rapidly to 10 or fewer barrels by the end of the month and then further decline in January.

An early indication that the supply would be small came from Tangier, where crab houses reported low catches of soft and peeler crabs this summer. Further indications came in the fall of 1962 with reports of low catches of hard crabs by crab pots throughout the lower Bay.

Typical Chesapeake Bay crab pot.



The picture appeared similar to that of the winter of 1959/60, when scientists also predicted below-average catches. December 1959 opened with large catches too, but catches dropped to about 10 barrels the middle of the month and then continued a slow decline over the next two months. Although the supply was supplemented with truck shipments from the Carolinas, some of the crab houses were operating only about three days a week.

"Relief from the short supply in the Bay may not be in sight in 1963," a marine scientist at the Virginia Institute of Marine Science reported. "The 1962 hatch of crabs appears to have been light, and our tentative prediction is that the stocks will remain low through 1963 and until August 1964. We have seen signs of a very late fall hatch, but the crabs were too small to be caught in our experimental trawl net surveys and we have been unable to estimate their number. Nothing further can be learned about the size of the crop until field surveys begin again in May 1963."



Delaware River Basin

COOPERATIVE FEDERAL-STATE STUDY YIELDS DATA ON FISHERIES RESOURCES:

A study of fisheries conditions in the Delaware River had been conducted cooperatively over the past four years by the U. S. Fish and Wildlife Service and the States of New Jersey, New York, and Pennsylvania. The study has produced a mass of valuable data which needs to be analyzed and evaluated in order to be useful for the protection and improvement of the fisheries resources of the Delaware River Basin. The Delaware River Basin Commission in a formal resolution urged that Federal funds be made available to the U. S. Fish and Wildlife Service for this purpose. (Delaware Basin Bulletin, November 1962.)



Frozen Fish

PATENT GRANTED FOR CHEMICAL SOLUTION THAT REDUCES DRIP:

A new treatment designed to reduce the thawing and cooking drip of frozen fish involves dipping the fish in certain chemical

solutions before the fish are frozen. The inventor of the new treatment claims that his method produces no undesirable side effects. He also claims that frozen fish treated according to his invention have a reduced tendency to turn yellow and are less susceptible to the development of rancidity. (Patent Number 3,036,923, granted May 29, 1962, to John H. Mahon, Scott Township, Allegheny County, Pa., assignor to Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.)

In describing the important agents in the new chemical solutions covered by the patent, the inventor states, "The exact mechanism by which my invention produces its remarkable results is not known. I have found that the sodium and potassium molecularly dehydrated phosphates having a molar ratio of alkali metal oxide to P_2O_5 of about 1 to 1 to about 2 to 1 will significantly reduce thawing drip. . . . when I refer to the 'molecularly dehydrated phosphates,' I mean to include both crystal-line and glassy forms within the specified range of ratios of alkali metal oxide to P_2O_5 ."

The inventor tested certain solutions covered under the new patent on fresh fish fillets. The fillets were air-expressed from Boston, Mass., to Pittsburgh, Pa., under continual refrigeration. After dipping in the test solutions which were held at 40° F., the fish fillets were allowed to drain, thoroughly, weighed, sealed in polyethylene bags, and frozen at 0° F. The frozen fillets were then held from 7 to 85 days before thawing. The test solutions were evaluated by measuring thawing drip, phosphate pickup, dip uptake, and pH of the fillets. One of the most effective additives in the test solutions was sodium tripolyphosphate ($Na_5P_3O_{10}$) in a concentration of about 12.5 percent. When used in a 4-percent brine solution, that additive reduced thawing drip from fillets held frozen for 34 days to 0.3 percent; used alone the same additive reduced thawing drip from fillets held frozen for 35 days to 1.8 percent. ("Thawing drip" is the weight of fluid lost on thawing calculated as a percentage of the weight immediately before freezing; that is the weight after being dipped and drained.)

The results from various test solutions are described in detail in the patent. A copy of Patent No. 3,036,923 can be obtained for 25 cents from the Commissioner of Patents, Patent Office, U. S. Department of Commerce, Washington 25, D. C.

Editor's Note: It has been reported that a fishery firm in Gloucester, Mass., is using the patented process described above and that the Gloucester firm has obtained a trademark for the process. It has also been reported that the Federation of Icelandic Cooperative Societies got a license on November 8, 1962, to use the process and that it will be used on about 16 percent of Iceland's frozen fish.



Fur Seals

ALASKA SKINS APPRAISED PRIOR TO LETTING PROCESSING CONTRACT:

In December last year, 101 luxury seal furs were appraised by five experts of the fur trade to mark another step in the U. S. Department of the Interior's program to select a contractor to process Alaska's Pribilof Islands fur seal harvest. The industry experts who participated in the recent appraisal were from Chicago and New York City.

The 101 first were submitted by 4 of the 5 firms which have expressed an interest in securing a Government contract for processing the Pribilof Islands fur seal skins. The old contract with the Fouke Fur Company of Greenville, S. C., was terminated on December 31, 1962.

The next step in the selection of a contractor was to submit the luxury furs to the U. S. Bureau of Standards for physical and chemical tests. The ability of the firm to fulfill the contract also was to be considered before any award was made. Selection of the contractor or contractors was expected to be made after February 1963.

As a basis for the contract negotiation, the U. S. Bureau of Commercial Fisheries issued an invitation for proposals and prospectus in June 1962, for the processing and selling of the furs. Raw skins were supplied to 11 firms and individuals for use in developing an adequate process.

The Federal Government has managed the Pribilof Islands seal herd since 1911. Between 1867 (when the United States obtained the Islands located in the Bering Sea as part of the Alaska purchase) and 1911, harvesting of sealskins was done by contract. Today it is done by Alaska natives under the supervision of Interior's Bureau of Commercial Fisheries.

In 1911 the United States, Canada, Japan, and Russia entered into a treaty on the management of fur seals. This was the first step by the United States in international conservation. Under the treaty all killing of seals out at sea was stopped. This made it possible to begin conservation of the Pribilof fur seal herd. The task was assigned to the Bureau.

In 1962 about 78,000 of the fur seal pelts were harvested. Furs sold in 1962 were valued at more than \$4 million.

Note: See *Commercial Fisheries Review*, December 1962 p. 33, August 1962 p. 92, and January 1962 p. 65.

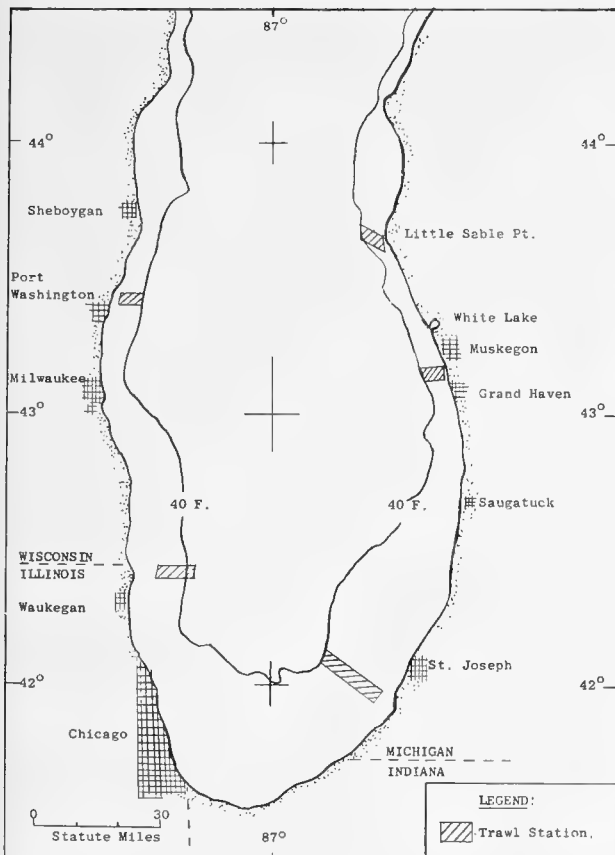


Great Lakes Fisheries

Exploration and Gear Research

TRAWL FISHING EXPLORATIONS OF SOUTHERN LAKE MICHIGAN COMPLETED FOR 1962:

M/V "Kaho" Cruise 6 (November 13-21 and December 11-20, 1962): Trawl exploration

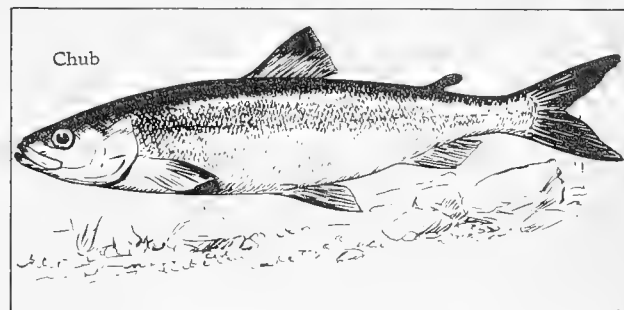


Lake Michigan explorations M/V *Kaho* Cruise 6 (November 13-21 - December 11-20, 1962).

tions along the east and west shores of southern Lake Michigan were completed for 1962 with fishing operations at preselected locations. Conducted by the exploratory fishing vessel *Kaho* of the U. S. Bureau of Commercial Fisheries, the objectives of the study were to obtain additional seasonal information concerning the depth and geographic distribution of various fish stocks and their availability to commercial-type bottom trawls.

A total of 48 drags was made at three locations (Benton Harbor, Grand Haven, and Little Sable Point) on the eastern side, and two locations (Waukegan and Port Washington) on the western side of the Lake. All drags were of 30 minutes except one that was terminated when commercial gill-net sets were encountered. Bottom obstructions were met during 4 drags and severe net damage resulted during 3 of them. Standard 50-foot (headrope) Gulf of Mexico-type semiballoon trawls were used.

Fishing results were generally good on both sides of the Lake with the exception of the Port Washington station which was fished in December only (see tables 1 and 2). Best catches from the other stations ranged from 345 to as much as 1,850 pounds per drag in November, and from 905 to 1,150 pounds per drag in December. Most productive depths were 20 to 35 fathoms in November and 25 to 40 fathoms in December.



Alewife and "bloater" chubs dominated all significant catches except those taken during three drags at 15, 20, and 25 fathoms off Waukegan in November. These drags yielded 625, 180, and 270 pounds, respectively, of mostly commercial size yellow perch. Large chubs made up to seven percent of each catch of that species. Except for smelt which were taken in quantities up to 50 pounds per drag, all other species collectively amounted to less than five percent of each significant catch.

Although severe weather conditions prevailed over Lake Michigan during November and December, fishing conditions were good at least 50 percent of the time during each of the cruise periods. The start of the December phase was delayed 3 days due to a record-setting blizzard, and 2 days were lost due to equipment breakdown. Surface water temperatures ranged from 49° to 53° F. in November and from 34° to 43° F. in December.

Table 1 - Trawl Explorations, Lake Michigan (East Side) by M/V Kaho Cruise 6 (Phase I--November 14, 18, 19; Phase II--December 14, 1962)

Areas Fished on Eastern Side of Lake Michigan				
Nearest Five-Fathom Depth Increment	Benton Harbor		Grand Haven	
	Phase I		Phase II	
	Phase I	Phase I	Phase II	Little Sable Point
	..... (Catch Rate--Pounds Per 30-Minute Drag)			
10	T ¹ / ₁	203 (74-A) (23-B) (3-0)	0	66 (3-B) (3-0)
15	(96-A) ² / ₂ 75 (2-B) (2-0)	(73-A) 219 (22-B) (5-0)	(94-A) 48 (2-B) (4-0)	(64-A) 104 (8-B) (28-0) ² / ₂
20	(87-A) 345 (3-B) (10-0) ³ / ₃	(80-A) 250 (17-B) (3-0)	(94-A) 32 (1-B) (5-0)	(36-A) 760 (54-B) (10-0) ³ / ₃
25	(82-A) 325 (15-B) (3-0)	(69-A) 436 (27-B) (4-0)	(87-A) 1150 (13-B) (----)	(36-A) 480 (61-B) (3-0)
30	(73-A) ³ / ₃ 44 (20-B) (7-0)	(57-A) ³ / ₃ 210 (39-B) (4-0)	(71-A) 700 (29-B) (----)	(59-A) 620 (39-B) (2-0)
35	(67-A) 260 (31-B) (2-0)	(25-A) 474 (70-B) (5-0)	(83-A) 500 (17-B) (----)	(12-A) ³ / ₃ 410 (85-B) (3-0)
40	(22-A) 310 (75-B) (3-0)	(33-A) 365 (66-B) (1-0)	----	(12-A) 370 (85-B) (3-0)
45	----	----	----	(10-A) ³ / ₃ 52 (83-B) (7-0)

1/1 - Trace (less than 5 pounds).

2/Percentage breakdown of catch by species.

Legend:

A = alewife

B = bloater chub

C = other species

3/Mostly sizable size yellow perch.

4/Gear malfunctioned.

5/10-minute drag.

6/Net badly torn.

7/Mostly whitefish.

8/Mostly large "moker-size" chubs.

Table 2 - Trawl Explorations, Lake Michigan (West Side) by M/V Kaho Cruise 6 (Phase I--November 15, Phase II--December 15, 16, 19)				
Areas Fished on Western Side of Lake Michigan				
Waukegan				
Port Washington				
Phase I				
Phase II				
Phase II				
. (Catch Rate--Pounds Per 35-Minute Drag)				
Nearest Five-Fathom Depth Increment	10	----	----	----
	15	(10-A) ¹ / 790 (5-B) (85-0) ² / (85-0)		

1/Percentage breakdown of catch by species:

Legend:

A = alewife

B = bloater chub

C = other species

2/Mostly sizable size yellow perch.

3/Net badly torn.

4/Mostly smelt.

5/T = Trace (less than 5 pounds).

This cruise completed a year-long trawl investigation in southern Lake Michigan which furnished periodic evaluation of certain areas during the months of February, March, April, June, July, August, November, and December

Table 3 - Summary of Best Catches, by Major Species, 1962 Lake Michigan Trawl Explorations, Michigan Side of Lake

		Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Area:		..... (Catch Rate--Pounds Per 30-Minute Drag)										
Benton Harbor	Alewife	xxxx ¹ / ₁	xxxx	T ² / ₂	xxx	T	200 (15)	200 (15)	xxxx	xxxx	300 (20)	xxxx
	Bloats	xxxx	xxxx	170 (40) ³ / ₃	xxx	185 (25)	175 (25)	175 (15)	xxxx	xxxx	235 (40)	xxxx
	Perch	xxxx	xxxx	5 (10)	xxx	--	70 (10)	6 (10)	xxxx	xxxx	16 (20)	xxxx
	Smelt	xxxx	xxxx	T	xxx	--	T	7	xxxx	xxxx	T	xxxx
Saugatuck Holland	Alewife	--	10 (40)	T	xxx	80 (10)	xxxx	5 (10)	xxxx	xxxx	xxxx	xxxx
	Bloats	87 (35)	110 (35)	135 (25)	xxx	160 (15)	xxxx	260 (15)	xxxx	xxxx	xxxx	xxxx
	Perch	150 (20)	12 (25)	T	xxx	T	xxxx	135 (10)	xxxx	xxxx	xxxx	xxxx
	Smelt	T	T	T	xxx	T	xxxx	---	xxxx	xxxx	xxxx	xxxx
Grand Haven	Alewife	xxxx	xxxx	10 (40)	xxx	25 (10)	10 (15)	T	xxxx	xxxx	360 (30)	1000 (25)
	Bloats	xxxx	xxxx	184 (30)	xxx	110 (35)	300 (15)	505 (15)	xxxx	xxxx	330 (35)	200 (30)
	Perch	xxxx	xxxx	T	xxx	T	T	40 (10)	xxxx	xxxx	T	--
	Smelt	xxxx	xxxx	T	xxx	--	--	T	xxxx	xxxx	T	T
Little Sable Point	Alewife	xxxx	xxxx	10 (35)	xxx	80 (10)	--	520 (10)	xxxx	xxxx	365 (30)	xxxx
	Bloats	xxxx	xxxx	210 (30)	xxx	105 (20)	340 (10)	510 (15)	xxxx	xxxx	400 (20)	xxxx
	Perch	xxxx	xxxx	T	xxx	T	5 (10)	15 (10)	xxxx	xxxx	T	xxxx
	Smelt	xxxx	xxxx	T	xxx	T	T	T	xxxx	xxxx	30 (20)	xxxx

1/xxxx = No fishing effort.

2/T = Trace (less than 5 pounds).

3/Numbers in parentheses indicate nearest 5-fathom depth increment from which catches were taken.

Table 4 - Summary of Best Catches, by Major Species, 1962 Lake Michigan Trawl Explorations, Wisconsin-Illinois Side of Lake

		Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Area:		..... (Catch Rate--Pounds Per 30-Minute Drag)										
Waukegan	Alewife	xxxx ^{1/}	xxxx	xxxx	xxx	130 (20) ^{2/}	400 (15)	T ^{3/}	xxx	xxx	1000 (35)	300 (40)
	Bloats	xxxx	xxxx	xxxx	xxx	400 (25)	580 (20)	285 (25)	xxx	xxx	880 (40)	600 (40)
	Perch	xxxx	xxxx	xxxx	xxx	5 (15)	145 (15)	--	xxx	xxx	625 (15)	T
	Smelt	xxxx	xxxx	xxxx	xxx	T	50 (15)	T	xxx	xxx	60 (20)	45 (25)
Milwaukee	Alewife	xxxx	xxxx	xxxx	xxx	65 (15)	30 (15)	--	xxx	xxx	xxxx	xxxx
	Bloats	xxxx	xxxx	xxxx	xxx	340 (25)	195 (35)	500 (35)	xxx	xxx	xxxx	xxxx
	Perch	xxxx	xxxx	xxxx	xxx	T	T	--	xxx	xxx	xxxx	xxxx
	Smelt	xxxx	xxxx	xxxx	xxx	--	15 (20)	--	xxx	xxx	xxxx	xxxx
Port Washington	Alewife	xxxx	xxxx	13 (25)	xxx	15 (20)	T	T	xxx	xxx	xxxx	T
	Bloats	xxxx	xxxx	435 (30)	xxx	285 (20)	320 (20)	1000 (20)	xxx	xxx	xxxx	180 (30)
	Perch	xxxx	xxxx	T	xxx	--	--	--	xxx	xxx	xxxx	--
	Smelt	xxxx	xxxx	450 (20)	xxx	T	T	T	xxx	xxx	xxxx	6 (20)
Two Rivers	Alewife	xxxx	xxxx	T	xxx	20 (25)	xxxx	60 (20)	xxx	xxx	xxxx	xxxx
	Bloats	xxxx	xxxx	365 (40)	xxx	85 (40)	xxxx	320 (20)	xxx	xxx	xxxx	xxxx
	Perch	xxxx	xxxx	--	xxx	T	xxxx	--	xxx	xxx	xxxx	xxxx
	Smelt	xxxx	xxxx	350 (30)	xxx	T	xxxx	5 (20)	xxx	xxx	xxxx	xxxx

^{1/}xxxx = No fishing effort.^{2/}Figures in parentheses indicate nearest 5-fathom depth increment from which catches were taken.^{3/}T = Trace (less than 5 pounds).

(see tables 3 and 4). Severe winter weather conditions curtailed operations through March.

On the east side of the Lake catches were of marginal commercial significance in April and June; catches on the west side, however, were good at some stations during that period. From July through December, all stations fished yielded catches which indicate a definite potential for profitable trawl production of alewife and/or "bloater" chubs. This held true each time the stations were visited with the possible exception of the Port Washington station in December.

Heaviest concentrations of "bloater" chubs were usually found in deeper waters than the heaviest concentrations of alewife, although there was considerable intermingling of these species. Best catches of both species were consistently taken from greater depths on the west side in comparison to the east side. The deeper waters (20-40 fathoms) were generally most productive in late winter, early spring, and fall months; shallower depths (10-25 fathoms) generally yielded the better catches in late spring and summer months.

M/V "Kaho" Cruise 8: Kaho will continue exploratory trawl fishing operations in southern Lake Michigan during the months of January, February, and March 1963. The vessel will operate in the southern portion of the Lake in a transect extending from Sauga-

tuck, Mich., on the east shore, to Racine, Wis., on the west shore.

The primary objective of the cruise will be to extend seasonal knowledge concerning the depth distribution and abundance of various fish stocks and their availability to bottom trawls. The results will provide information for Lake conditions and depths not studied in previous explorations.

Echo-sounding equipment will be used to survey bottom features and record fish concentrations. A 50-foot (headrope) Gulf of Mexico-type otter trawl will be towed at depths ranging from 5 to 90 fathoms to assess the commercial fishing potential. A 65-foot (headrope) western-style bottom trawl will be used in commercial production efforts where conditions warrant. Hydrographic and meteorological data will be collected at all fishing localities.

The M/V Kaho (Cruise 7) was scheduled to participate in a cooperative investigation with the U. S. Public Health Service during January 1963.

Note: See Commercial Fisheries Review, October 1962 p. 15, June 1962 p. 16.



Great Lakes Fishery Investigations

SPAWNING OF WHITEFISH IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR SURVEYED:

M/V "Siscowet" Cruise 9 (November 13-28, 1962): The annual assessment of spawning whitefish in the Apostle Islands area of western Lake Superior was made during cruise 9 of the U. S. Bureau of Commercial Fisheries research vessel Siscowet.

Large-mesh gill nets ($4\frac{1}{2}$ - to $5\frac{1}{2}$ -inch mesh) fished at depths of 3 to 6 fathoms on spawning grounds off Cat Island yielded 184 spawning whitefish (152 males, 32 females). The fish ranged in length from 16.1-23.8 inches; 169 were tagged and released. One whitefish which had been tagged on the same spawning grounds in 1961 was recovered. This is our first indication that whitefish may have a homing instinct. Water temperatures on the whitefish spawning grounds ranged from 40.3° - 42.8° F.

Small-mesh gill nets ($1\frac{1}{2}$ - and $2\frac{1}{2}$ -inch mesh) fished with the large-mesh nets on whitefish spawning grounds caught longnose suckers, round whitefish, and lake herring. Stomachs were examined from fish of each species, but only the round whitefish contained fish eggs. Since round whitefish, lake herring, and lake whitefish were all in spawning condition, the fish eggs were not positively identified.

Nearly $1\frac{1}{2}$ quarts of fertilized eggs were collected from round whitefish for studies of embryonic and larval development. Attempts to collect eggs from pygmy whitefish were unsuccessful; only a few were caught, all of which were females.

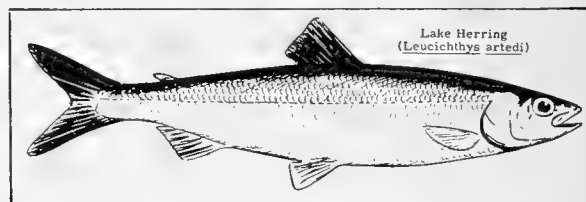
Studies were continued on the abundance and distribution of juvenile lake trout in the Apostle Islands area. Trawl tows yielded 394 lake trout, of which only one was not fin clipped. Nearly all of the fish were returned to the water after removal of the anal fin. Lake trout which had been planted from shore in the Bayfield area in 1962 were most common in the catches; fish from the 1961 and 1960 Bayfield plants were also well represented.

Note: See Commercial Fisheries Review, February 1962 p. 24.

* * * * *

SPAWNING HABITS OF LAKE HERRING AND CHUBS SURVEYED IN APOSTLE ISLANDS AREA:

M/V "Siscowet" Cruise 10 (December 3-13, 1962): Spawning habits of lake herring and chubs were studied in the Apostle Islands region of Lake Superior by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Most lake herring had spawned by December 3, but chubs (*Coregonus hoyi*, *C. zenithicus*) had not spawned by December 13. In previous years, lake herring and chubs have spawned at about the same time in that region. Fertilized eggs were collected from lake herring for studies of embryonic and larval development.



Although young-of-the-year alewives were taken in nearly every trawl tow during the fall of 1961, none were taken in 1962. Only 3 alewives (adults) were captured during the entire 1962 season.

Trawl tows at 18-22 fathoms in Pike's Bay yielded 66 juvenile lake trout, of which only 1 was not fin-clipped.

Of 1,873 small (less than 17 inches long) lake trout captured by the Siscowet in the

Fin-Clipped Lake Trout Recaptured in 1962 by M/V <u>Siscowet</u>		
Season, Year of Planting, Rearing Station, and Brood Stock	Recaptured During 1962	
	Total Recaptured	Number per 10,000 Fish Planted
Spring 1962:		
Bayfield-Marquette brood.	586	23
Pendills Creek-Marquette brood.	274	23
Fall 1962:		
Pendills Creek-Marquette brood.	70	6
Spring 1961:		
Bayfield-Marquette brood. .	315	29
Pendills Creek-Marquette brood.	280	26
Bayfield-Green Lake brood .	33	3
Fall 1960:		
Bayfield-Green Lake brood .	14	3
Spring 1960:		
Bayfield-Apostle Islands stock.	221	14
Spring 1959:		
Bayfield-Apostle Islands stock.	36	2

Apostle Islands region in 1962, 1,839 (98.2 percent) were fin-clipped. Most of the marked lake trout were returned alive to the water; more than 1,000 were re-marked by removal of the anal fin in an attempt to obtain information on population density, but only 3 of those were recaptured.

The table lists the number of fin-clipped lake trout recaptured from the various plantings and the number of fish caught per 10,000 lake trout planted. The data are based on a total of 184 15-minute trawl tows. Recaptures of less than 10 fish from a single planting are not listed.

Surface water temperature near the end of the cruise was 36.5° F. The cruise was terminated prematurely because of subzero temperatures and high winds.

Note: See *Commercial Fisheries Review*, January 1963, p. 31, December 1962 p. 37, November 1962 p. 24, October 1962 p. 17, September 1962 p. 26, August 1962 p. 21.



Gulf Exploratory Fishery Program

SEASONAL DISTRIBUTION OF ROYAL-RED SHRIMP AND HARD CLAMS SURVEYED IN GULF OF MEXICO:

M/V "Oregon" Cruise 83 (November 28-December 21, 1962): The objectives of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to continue seasonal assessment of the royal-red shrimp grounds off the Mississippi Delta and Dry Tortugas, to continue studies on the distribution of fauna of the upper



Fig. 1 - Setting the otter trawl on the exploratory fishing vessel Oregon.

Continental Slope between the 100 and 1,000 fathom contours, and to conduct a seasonal check on the shallow-water hard clam beds off western Florida.

Twenty-two trawling stations were completed off the Delta in depths of 100 to 480 fathoms. Concentrations of royal-red shrimp (*Hymenopenaeus robustus*) were light with best fishing centered between 205 and 225 fathoms. Seven three-hour tows with a 100-foot flat trawl produced only 919 pounds (heads-on) of red shrimp in this depth range. Heads-off count averaged 31-35 shrimp per pound.



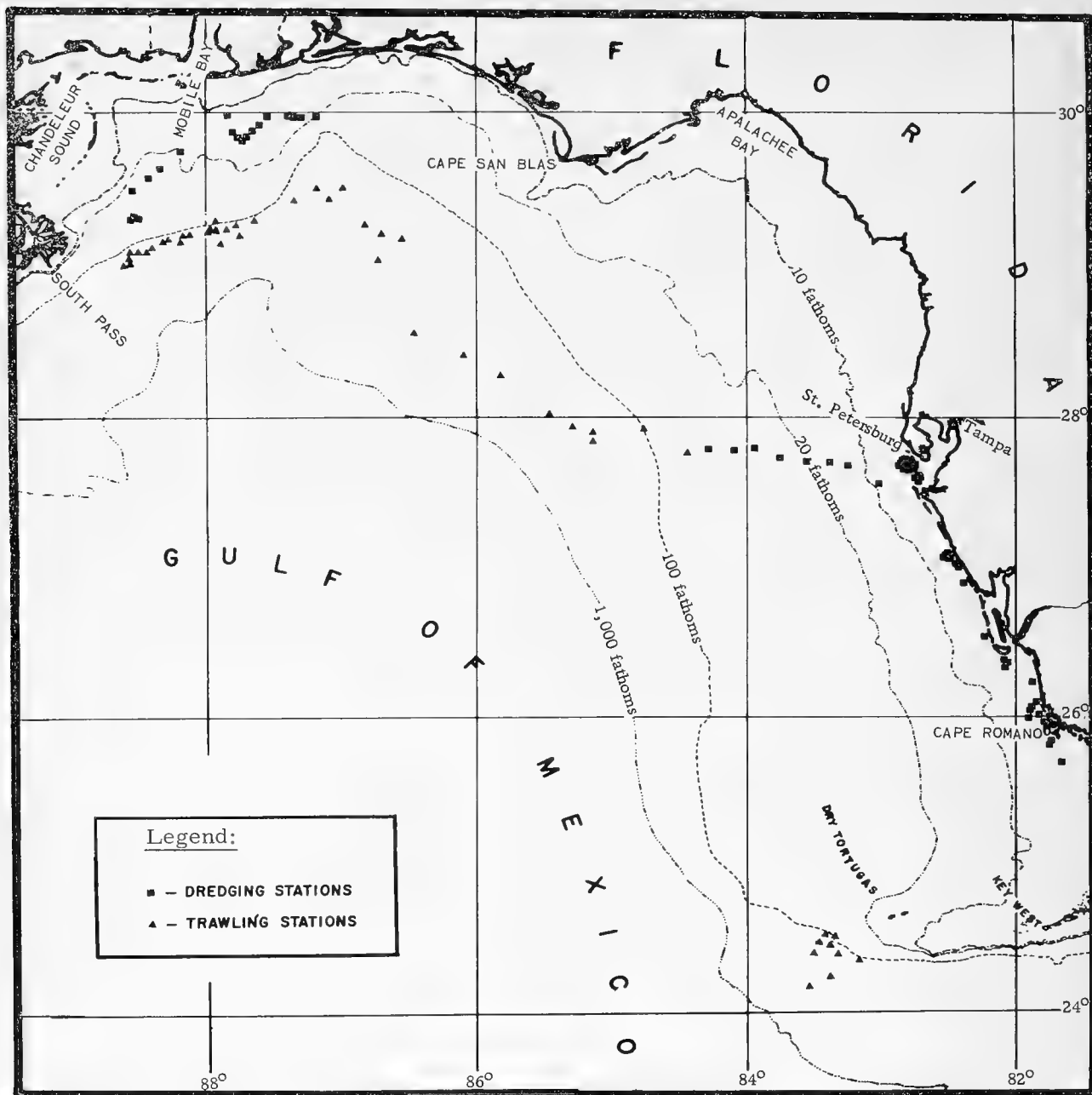
Fig. 2 - Part of a catch of royal-red shrimp on the deck of the M/V Oregon.

Nine tows southwest of Dry Tortugas in depths ranging from 100 to 500 fathoms showed highest concentrations between 190 and 210 fathoms. Eight and one-half hours of towing with a 100-foot trawl produced a total of 410 pounds of red shrimp (heads-on).

Fourteen exploratory tows were made in 200 to 275 fathoms between the offings of Pensacola and Tampa Bay. Red shrimp catches were poor, ranging from 0 to 105 pounds per two-hour tow.

Trawling transects beyond the 500-fathom contour were discontinued due to depth-recorder malfunction.

A total of 44 dredge hauls was made with a 22-tooth Fall River clam dredge along the southwest coast of Florida in depths of 3 to 5 fathoms. Towing time varied from 5 to 45 minutes depending upon bottom conditions. Best fishing was centered off St. Petersburg



Area covered by M/V Oregon during Cruise 83 (November 28-December 21, 1962).

where catches ranged from 20 to 185 hard clams (3-5 inches) per 30-minute tow. Northwest of Gasparilla Island in 4 to 5 fathoms a small area yielded as high as 154 clams in a 15-minute tow. Throughout the entire area worked, heavy beds of pen shells (*Atrina rigida*) hampered dredging efforts and sampling effectiveness was marginal.

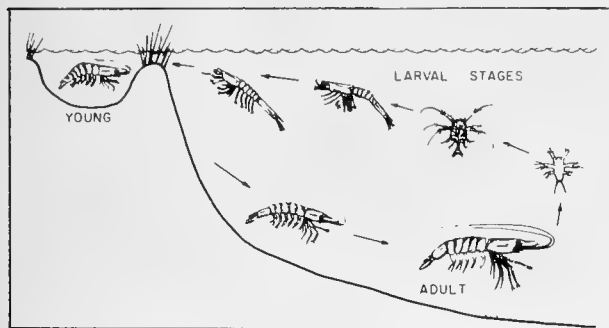
Note: See Commercial Fisheries Review, Jan. 1963 p. 31, November 1962 p. 25, October 1962 p. 19.

Gulf Fishery Investigations

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during October-December 1962:

SHRIMP FISHERY PROGRAM: Shrimp Spawning Populations: The percentages of

ripe and recently-spawned brown shrimp females taken off Galveston during June, July, and August 1962 agreed with comparable observations in 1961. In both years, females in spawning condition were more abundant at 25 than at 15 fathoms.



Life cycle of shrimp. Spawned in the ocean, the larvae (here greatly magnified) migrate to inshore nursery areas. As the shrimp grow, they return to sea where they support the most valuable of our commercial fisheries.

Preliminary examination of brown shrimp ovaries taken January through June 1962 from widely separated 25-fathom stations along the Texas and Louisiana coasts was completed. The results indicate that ovary conditions in the different samples were generally similar.

Six cruises during the quarter closed out sampling operations for 1962. They yielded biological material which included nearly 11,000 specimens of brown, pink, and white shrimp. All penaeid species appeared to be more abundant at the stations west of Galveston. The mean lengths of brown shrimp taken from the 25- and 35-fathom stations declined, suggesting that the smaller shrimp which were present in July and August in 7½ fathoms had moved offshore.

Shrimp Larvae Studies: During the quarter, 180 plankton samples collected between May and July 1962 were examined for penaeid larvae. The results show that the relative abundance of penaeid larvae in statistical areas 14, 16, and 17 remained unchanged from that of the preceding 4 months. However, in all other areas there was an increase in abundance. The increase was most evident in the 0- to 20-fathom zone.

Protozoa, mysids, and postlarvae constituted the bulk of the catch, although a marked increase in the number of nauplii indicated that spawning activity had intensified since the January-April period.

Bait Shrimp Fishery: During the quarter, commercial bait shrimp production in the

Galveston Bay area increased by 62 percent over that for the same period in 1961. However, catch per unit of effort for the same period rose by only 9 percent, indicating that demand rather than greater availability of juvenile shrimp was responsible for the increase.

Bait shrimp production in 1962 has surpassed that for any year during the four years the fishery has been given statistical coverage.

Commercial Bait Shrimp Production in Galveston Bay Area, Texas

Year	Catch	Effort	Catch/Effort
	Lbs.	Hrs.	Lbs./Hr.
1962 (Jan. -Nov.)	1,031,500	33,190	31.1
1961	731,200	25,305	28.9
1960	943,400	16,028	58.9
1959	516,800	1/ 9,550	1/ 45.1

1/ For period July-Dec. only.

Migrations, Brown and White Shrimp: As of mid-December, 150 (6 percent) stained and 88 (5 percent) tagged specimens had been recovered from the brown shrimp mark-recapture experiment initiated off Texas in April. Seven were recovered that had been at liberty for more than 6½ months. Preliminary analysis of the data indicates that natural mortality exceeded fishing mortality during the period April-July.

Returns from the brown shrimp projects undertaken in July appear to be complete with 624 (26 percent) and 73 (2.5 percent) recovered from the Grand Isle, La., and Galveston, Tex., experiments, respectively. Over 98 percent of the shrimp recovered from the Louisiana study were taken less than 30 nautical miles from the area of release. The remaining 2 percent had moved less than 60 miles. Almost 90 percent of the shrimp returned from the Galveston experiment were recovered less than 30 nautical miles from the release area. Three of the shrimp from the study traveled more than 130 miles in a southwest direction. In these experiments, the shrimp were marked either with a primary mark and a fluorescent pigment, which can be identified under ultraviolet light, or a primary mark only. No significant difference in the number of returns of the two types of marks was noted.

Two mark-recapture experiments with white shrimp were started during September 1962. A total of 1,905 stained shrimp of a restricted size group was released west of Vermilion Bay, and 2,291 stained shrimp of two different size groups were released

between Cameron, La., and Sabine Pass, Tex. As of mid-December 197 (9 percent) of the marked shrimp had been recovered from the Cameron experiment, and 77 (4 percent) had been returned from the Vermilion Bay experiment. A general westerly movement with little or no movement offshore is indicated by the recapture data.

A short-term mortality experiment conducted in the sea-water laboratory indicated there is no significant difference in the survival rate between shrimp injected with sterile distilled water and those injected with an equivalent amount of fast green FCF as the primary mark, and the fluorescent pigment blaze orange as a secondary mark.

Several groups of shrimp were marked with different fluorescent pigments and primary marks to determine the longevity of the secondary marks, and to determine whether those marks can be differentiated from one another. It appears that 5 of the 6 fluorescent pigments tested can be differentiated, thereby increasing from 2 to 12 the number of proven staining agents which can be identified and used to mark shrimp.

Migrations of Pink Shrimp: Representatives of the 19,860 small pink shrimp stained and released at Indian Key, Fla., in August and September had been recaptured both on the Tortugas fishing grounds to the southwest and on the Sanibel grounds to the northwest. One marked shrimp was recovered in Boca Grande Channel near the northern end of the Sanibel fishing area approximately 73 nautical miles from the Indian Key release site.

Preliminary analysis of returns from the mortality experiment started off Sanibel Island in March 1962 was completed this quarter.

Between December 11 and 15, 2,350 pink shrimp, carefully sorted to uniform size, were stained and randomly released on the Tortugas grounds. Recoveries were coming in at a rapid rate, reflecting a high degree of activity by about 250 vessels fishing in the area. Comprehensive coverage of five landing ports in south Florida will assure a maximum number of recoveries and also furnish daily fishing effort data needed for analysis. An experiment designed to estimate the number of stained shrimp passing through the fishery unnoticed is also being conducted.

Commercial Catch Sampling: During the quarter, "northers" and fog hampered fishing operations along the Texas and Louisiana coasts. Catch per unit of effort, however, remained relatively high for both brown and white shrimp. Pink shrimp, taken only incidentally with brown shrimp, were noted in less than a dozen landings. Total landings were bolstered substantially by large numbers of white shrimp emerging from the estuaries, principally in the Galveston and Sabine Pass areas.

BEHAVIOR PROGRAM: During the quarter a new conductivity cell was designed, constructed, and tested for use in measuring experimental salinity gradients. The new equipment fills the Laboratory's need for an instrument which measures conductivity at precise locations within a salinity gradient. Existing commercial conductivity cells are much less satisfactory in this regard due to their large size and relatively closed construction (which tends to prevent rapid equilibration of fluid within the cell with that outside it).

Using this equipment, an experiment was conducted to determine whether the previous salinity history of juvenile shrimp influences behavior in a continuous salinity gradient. Five shrimp held at 25‰ (parts per thousand) were introduced into a salinity gradient (4‰ - 88‰) together with five shrimp held at 90‰ (near the absolute limiting level for this animal). Observations made over a 1½-hour period showed a marked degree of difference between the salinity ranges of the two groups of animals. These results indicate a definite short-term influence of salinity history on the salinity range subsequently selected. These findings suggest that the capacity for salinity conditioning we previously reported for postlarval shrimp is also possessed by the juvenile. They also serve to emphasize that the salinity preference range for young shrimp is not only broad, but flexible. These characteristics would seem to be of great importance to shrimp during the estuarine phase of the life cycle.

Twenty-five experiments were performed to find out if occasional variation in response to temperature gradients could be associated with stages of the molt cycle. No relationship has yet been observed.

A growth experiment, similar to those in which salinity effects have been tested, has demonstrated speciation problems. Postlarvae

obtained on September 27 and held in the laboratory for 2 weeks were subdivided by size into "large" and "small" groups. Examination of 34 "small" specimens, 12 mm. rostrum-telson length or less, indicated that, on the basis of relative distance from rostrum to eye and from third pereopod to eye, the animals were grooved. Subsequent study indicated, however, that the "small" specimens were, in fact, nongrooved white shrimp. It would appear, therefore, that the above characteristics may not be reliable for identifying the postlarvae of species in these waters. Complete series of postlarvae and early juveniles (from 9 to 35 mm. total length) of grooved and nongrooved shrimp are now available for further study as a result of this and the first salinity experiment.

Present results indicate that brown shrimp contain more carotenoid pigments than white shrimp of equal size. Using a microhomogenizer, tests have been conducted with whole animals as small as 0.3 gram total weight (about 35 mm. total length).

Considerable time was spent during the quarter testing the "CHROMAC"--a device to speed the development of paper chromatograms for possible use in characterizing shrimp species biochemically. Various solvents, including water-saturated phenol, butanol, acetic acid, water, and propanol were tested in separations of standard amino acid solutions, and in extracts of shrimp muscle. It was found that standard paper chromatographic techniques, though slower, gave better and more reproducible chromatograms of the extracts than the CHROMAC.

Studies on rate of brine shrimp hatch were begun. It has been found that hatch is maximal after 18 hours at 30° C. (86° F.) and after 22 hours at 25° C. (77° F.) with hatch rate decreasing rapidly after these times. Oxygenation increases yields at both temperatures--dramatically so at 30° C. A technique for counting brine shrimp nauplii has been developed and tested for precision and accuracy. This information will be used to quantify the food requirements in future work on growth in immature estuarine animals.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Analysis of previously collected field data continues. Three areas suitable for comparison in 1961 are (1) Offats Bayou--a small, highly saline body of water with average annual salinity of 18.7‰; (2)

Clear Lake--a small, protected, moderately low saline body with salinity averaging 4.7‰; and (3) Trinity Bay--a large, open bay with salinity averaging 4.0‰, very similar to Clear Lake.

Of the seven most common species caught by trawl in the Galveston Bay system, only one, the spot, was abundant in Offats Bayou. Five of the remaining species, the brown shrimp, white shrimp, croaker, sand sea trout, and blue crab, were much more numerous in Clear Lake than in Trinity Bay even though salinity was similar. Only the bay anchovy was equally abundant in the two low salinity areas. The apparent preference of those species for Clear Lake could very well be a result of sampling bias. Collection stations in Trinity Bay were further from the shore zone than in Clear Lake. Additional study is needed to resolve this problem. With the following reservations, periods of peak abundance for the seven species varied considerably from year to year but for a particular year occurred almost simultaneously in each of the three areas. Peaks were generally reached first in Offats Bayou, then in Clear Lake and Trinity Bay, the latter two areas being farthest removed from the Gulf. Neither the time at which peak abundance occurred nor the corresponding level of abundance seemed to be correlated with salinity. Additional study of the data is indicated.

Species abundance also fluctuated considerably from year to year, with amplitude generally highest for the two species of shrimp and lowest for the blue crab. During the period of study (1958-61), maximum seasonal concentrations of both white and brown shrimp occurred in 1960 followed by a sharp decline in 1961. A similar occurrence was not evident for the other species.

The field (sampling) program is being revised to permit a much more detailed comparison between specific subareas within the Galveston Bay estuarine system as a whole. Generally, the system has been divided so that data can be obtained from the near-shore area of the adjacent Gulf, tidal passes, Lower Galveston Bay, Upper Galveston Bay, the mouth of the San Jacinto River, Trinity Bay, and East Bay. A statistical balance between channel, open-water, and shoreline stations in each subarea and between subareas has been incorporated. In addition, tertiary bays or bayous adjacent to each subarea (except the near-shore Gulf area) are included. Sta-

tions are also to be established in the marsh areas adjoining each subarea.

Both hydrological and biological data will be collected. Arrangements have been made with the Corps of Engineers for an exchange of hydrological measurements. The Corps is presently initiating a large field program in the Galveston Bay system to obtain prototype data for a model study. The data resulting from our mutual efforts should provide the basis for obtaining very good definition of the estuary's hydrological parameters.

Effects of Engineering Projects: Under the present system of coordination with the Branch of River Basin Studies, 24 appraisals were made of engineering and mineral development projects potentially affecting fishery resources in Texas estuaries. The majority resulted from the more than 120 Corps of Engineers public notices received during the quarter. Marine fishery sections of 17 Bureau of Sport Fisheries and Wildlife draft reports on water development projects were received for concurrence of recommendations.

Most of the Corps of Engineers public notices dealt with applications for Department of the Army private permits for mineral development, pipeline construction, channel dredging or bulkheading, and filling. Frequently, these projects require modification to reduce damage to the estuarine habitat and dependent fishery resources. When this is the case, recommendations for corrective action are forwarded to the Branch of River Basin Studies, which in turn, requests the Corps of Engineers to require the applicant to modify the original plans. If oyster leases or reefs are involved, the Corps is requested to have the applicant secure approval of the Texas Game and Fish Commission.

INDUSTRIAL FISHERY PROGRAM: Sea Trout: The average annual landings of sand sea trout (*Cynoscion arenarius*) and silver sea trout (*C. nothus*) from the north central Gulf of Mexico have been estimated at 3,382 tons or 8 percent of the total industrial fishery otter-trawl catches for the years 1959 through 1961.

The relative abundance of the two species of sea trout in inshore waters was determined from samples of trawler catches taken routinely from December 1961 to November 1962. The sand sea trout was approximately four times as abundant east of the Mississippi

River Delta, and predominated in the samples each season. Samples from catches made west of the Mississippi River Delta showed that the silver sea trout was about $1\frac{1}{2}$ times as abundant as the other species, and was dominant in the samples from late winter through early fall. The average bottom depth at which fishing occurred varied between 4 and 12 fathoms in both areas.

Sand sea trout were more abundant at all contour depth intervals except the 20- to 29-fathom range. Maximum depth at which sand sea trout were caught with a bottom trawl was 60 fathoms. The maximum depth for silver sea trout was 40 fathoms.

Analysis of length-frequency data from catch samples of the M/V Oregon and the industrial trawler fleet shows that a larger size group (21.0-23.5 cm. or 8.3-9.3 inches) of silver sea trout predominated over bottom depths of 20-29 fathoms while a smaller size group (18.5-20.0 cm. or 7.3-7.9 inches) was dominant over grounds less than 10 fathoms. Data for the sand sea trout reveal a similar distributional pattern in fall with a smaller size group (19.5-22.0 cm. or 7.7-8.7 inches) present inshore (7-10 fm.) and a larger group (26.0-27.0 cm. or 10.2-10.6 inches) offshore (60 fm.).

Menhaden: Large-scale menhaden (*Brevoortia patronus*) are present in Alabama, Mississippi, and Louisiana coastal waters throughout the year, but vary in abundance and size according to season and area. Examination of length-frequency data collected each month (November 1961 through November 1962) from samples of commercial bottom-trawl catches disclosed the presence of three principal size groups between Gulf Shores, Alabama, and Ship Shoal, Louisiana.

A principal modal group (9.0 cm. or 3.5 inches) appearing in winter samples from east of the Mississippi River Delta, progressively increased in size through the following fall (15.0 cm. or 5.9 inches). Large fish (modes 16.0 or 6.3 inches, and 18.5-19.5 cm. or 7.5-7.7 inches), which were present in the samples each month, were relatively more abundant in late fall and early winter. Approximately 48 percent of the fish from east of the Delta samples were between 15.5 and 20.5 cm. (or 6.1-8.1 inches) long.

Three discrete modal-length groups were present in samples from west of the Missis-

Mississippi River Delta. An intermediate group (15.5-16.5 cm. or 6.1-6.5 inches) was prominent in late winter, increased in size through spring and summer, predominated in late summer samples (mode 15.0 cm. or 5.9 inches) and then disappeared in the fall. Fish representing a larger modal group (17.5-19.5 cm. or 6.9-7.7 inches) were relatively more abundant in spring, early summer, and fall. Length-frequency data show that approximately 80 percent of the fish in samples from west of the Mississippi River Delta were between 15.5 and 20.5 cm. (or 6.1-8.1 inches) long.

CONTRACT RESEARCH: Life History of Late Postlarval and Juvenile Pink Shrimp in Everglades National Park Nursery Grounds: This new project, which began on October 1, 1962, seeks accurate quantitative data on young pink shrimp in an outlet of the nursery grounds. Information on relative abundance, sizes of shrimp, sex ratios of shrimp, and movements of shrimp in this canal in response to environmental conditions will be obtained.

To date, the sampling area has been defined and a special sampling net designed and installed in Buttonwood Canal (at Flamingo, Fla.). Initial trials indicate that with some modification of the cod end, the special net can be used to obtain samples on both ebb and flood tides and can be raised and lowered quickly so as not to interfere with boat traffic. Removal of snags by underwater searching and modification of the canal banks to prevent escapement of shrimp around the ends of the net have been accomplished.

The first night sample, taken on December 10, resulted in 90 pink shrimp being caught in 50 minutes. The small numbers were consistent with results for the same season from previous years. In addition, the size distribution of those shrimp was similar to that of shrimp taken in the same general area with dip nets during Decembers of previous years.

After the net was installed, underwater observations showed that at peak current velocities the lead line rose about 18 inches from the bottom of the canal. Additional weights placed on the bottom line of the net did not remedy the difficulty. It was therefore decided to modify the width of the cod end opening to reduce the drag caused by the net and thereby permit the lead line to remain on the

bottom of the canal at all current velocities. If the modified net works as expected, regular sampling will be started the first week of January.

Research Contracts: New contracts were awarded to the Gulf Coast Research Laboratory, Ocean Springs, Miss., to undertake research on the occurrence and abundance of postlarval shrimp in the Mississippi Sound area (\$30,000), and to the University of Miami to determine the seasonal distribution and density of postlarval and juvenile pink shrimp in Florida Bay-Everglades area (\$42,000).

* * * * *

PINK SHRIMP STAINED AND RELEASED FOR MORTALITY STUDIES:

M/V "Silver Bay" Cruise 44 (December 4-17, 1962): To capture, stain, and release live pink shrimp (*Penaeus duorarum*) caught off the Tortugas Islands (off southwest tip of Florida) was the objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

Despite unusually rough seas, close to 2,300 live pink shrimp were stained and released in excellent condition on the Tortugas fishing grounds between December 11-15, 1962.

Note: See Commercial Fisheries Review, December 1962 p. 40, August 1962 p. 26, and June 1962 p. 20.

* * * * *

SHRIMP DISTRIBUTION STUDIES IN GULF OF MEXICO:

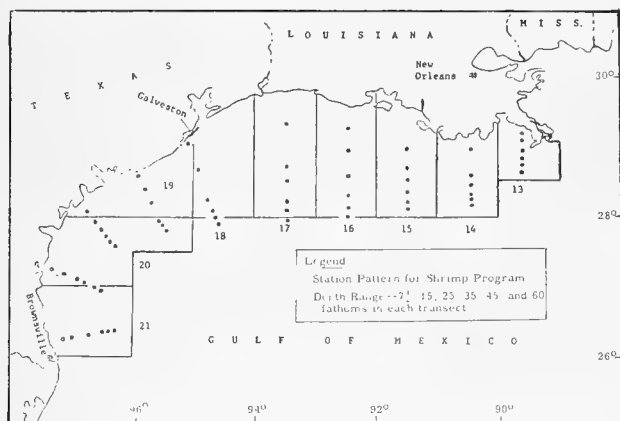
M/V "Miss Angela" Cruise MA-15 (November 29-December 5, 1962): Fair catches of 12-15, 15-20, 21-25 count brown shrimp were caught off the Louisiana coast (except off Cameron) in the 20-40 fathom range by the chartered commercial fishing vessel Miss Angela. The vessel, operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries, is engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico. In addition, catches of brown shrimp and some white shrimp (mostly 21-25 and 26-30 count) were made in the 0-20 fathom depth range.

Five statistical areas (13, 14, 15, 16, and 17) were covered in depths ranging from 0-60 fathoms. One three-hour tow in each of the three ranges (20 fathoms, 20-40 fathoms, and 40-60 fathoms) was made.

The best single catch per three-hour tow was 33 pounds of 15-20 count brown shrimp taken in 20-40 fathoms in statistical area 15. The same area yielded 18 pounds of 26-30 count white shrimp in the 0-20 fathoms depth range. Area 14 yielded 25 pounds of 12-15 count brown shrimp in the 20-40 fathoms depth range, and area 16 yielded 24 pounds of 26-30 count white shrimp in the 0-20 fathom depth range.

Catches were very light from all depth ranges in area 17 (off Cameron, La.).

M/V "Miss Angela" Cruise MA-16 (December 14-19, 1962): Shrimp distribution studies were continued off the Louisiana coast in statistical areas 13, 14, 15, 16, and 17 during this cruise by the chartered shrimp fishing vessel Miss Angela. One three-hour tow



Shows station pattern for Cruise MA-16 of M/V Miss Angela (December 14-19, 1962).

was made in depths of 0-20 fathoms, 20-40 fathoms, and 40-60 fathoms in each of the areas. Some good catches of 15-20 count and 21-25 count shrimp were made in the 20-40 fathom depth range.

The catch in the 0-20 fathom depth range in area 13 was 12 pounds of 31-40 count brown shrimp and a few 26-30 count white shrimp. The catch (all brown shrimp) in the 20-40 fathom depth range was only 4 pounds of 31-40 count and in 40-60 fathoms one pound of 15-20 count.

In statistical area 14, the 20-40 fathom depth range yielded 13 pounds of mixed brown shrimp, and one pound of mixed brown shrimp was taken in 40-60 fathoms. Yield from 0-20 fathoms was less than three pounds of brown, white and pink shrimp.

One tow in area 15 in the 20-40 fathom depth range yielded 12 pounds of 21-25 count brown shrimp and another tow in 40-60 fathoms yielded 10 pounds of 15-20 count brown shrimp. A few small brown shrimp and less than one pound of 26-30 count white shrimp were taken in 0-20 fathoms.

In area 16 no tow was made in the 0-20 fathoms due to fog. The catch of brown shrimp amounted to 16 pounds (15-20 count) in 20-40 fathoms and 11 pounds (12-15 count) in the 40-60 fathoms.

The best catch per tow was made in 20-40 fathoms in area 17--37 pounds of 15-20 count brown shrimp per three-hour tow were caught. The catch from the deeper water (40-60 fathoms) amounted to 6 pounds (12-15 count) of brown shrimp.

The shallow water tow yielded trace amounts of 15-20 count brown shrimp and 2 pounds of 15-20 count pink shrimp.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, Jan. 1963 p. 32, Dec. 1962 p. 42, Nov. 1962 p. 26, Oct. 1962 p. 21, Sept. 1962 p. 29, Aug. 1962 p. 25.



Gulf of Mexico

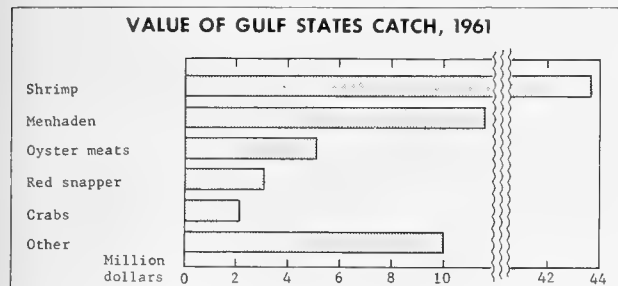
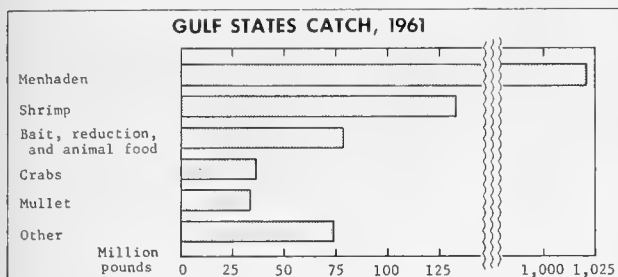
FISHERIES LANDINGS, 1961:

Fish and shellfish landings during 1961 in the Gulf States (West Coast of Florida, Alabama, Mississippi, Louisiana, and Texas) amounted to a record 1.4 billion pounds valued at \$75.5 million ex-vessel. This was a



Fig. 1 - Shrimp otter trawlers docked at Aransas Pass, Tex.

gain of 111 million pounds, but a decline of \$10 million as compared with 1960.



The increased quantity resulted from record menhaden landings amounting to more than 1 billion pounds--up 180 million pounds over the peak 1960 production. The catch of oysters (18.2 million pounds) and red snapper (11.9) exceeded the 1960 levels by 2.1 and 1.7 million pounds, respectively. Catfish and bullheads, hard blue crabs, and black and red drum were also taken in greater quantities in 1961.

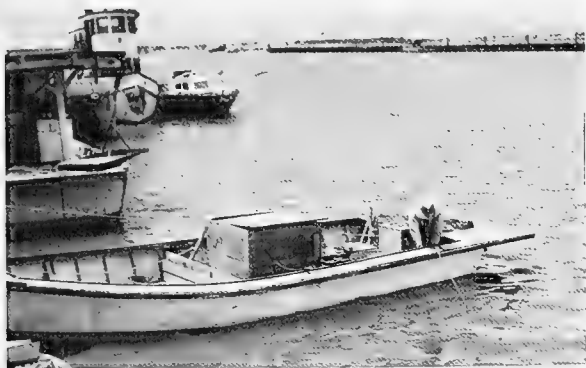


Fig. 2 - Crab boat fishing in Matagorda Bay.

The yield of shrimp (133.8 million pounds) fell 71.9 million pounds below the 1960 level and was the lowest since 1949. The decline in quantity of this high-priced species largely accounted for the marked reduction in value which occurred during 1961.

Three States (Louisiana, Mississippi, and Texas) accounted for 1.2 billion pounds or 90

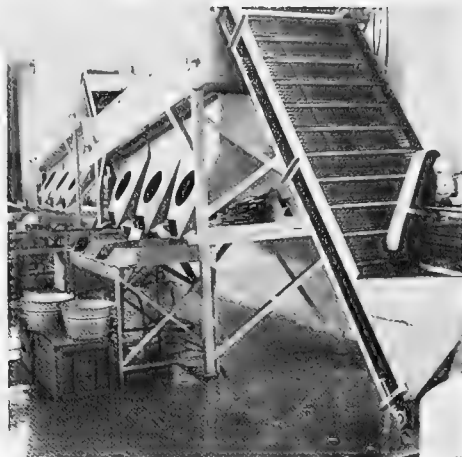


Fig. 3 - Shrimp sorter inside a processing plant in Brownsville, Tex.

percent of the volume; while Texas, Louisiana, and the West Coast of Florida accounted for \$66 million or 87 percent of the value.

There were 22,249 fishermen engaged in the Gulf fishery in 1961. Commercial fishing craft operating in those States during 1961 consisted of 3,270 vessels of 5 net tons and over, 8,571 motor boats, and 640 other boats.



Industrial Fishery Products

OXIDATION OF FISH OILS SLOWED BY ADDITION OF PHOSPHOLIPIDS TO ANTIOXIDANT:

Studies on the phospholipids of tuna and menhaden oils at the University of California, in Berkeley, Calif., are being supported by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Seattle, Wash., to determine their role in the oxidation (rancidity) of the oils in fishery products.

It has been found that phospholipids alone do not inhibit oxidation of those oils. However, when phospholipids are combined with a synthetic antioxidant, there is a very significant increase in the ability of the synthetic antioxidant to prevent oxidation. This significance is indicated by the following example. An antioxidant alone will protect menhaden triglycerides from oxidizing for a period of three days. However, the addition of three-percent phospholipid to the antioxidant will protect the triglycerides from oxidation for periods up to three months. This effect is attributable to presence of a nitrogenous

group in the radical phospholipid molecule.

Fish oils are composed of several different classes of chemical compounds including phospholipids. The amount of phospholipid in whole fish does not vary extensively, in that all fish contain between 0.5 and 0.7 percent phospholipids. Thus, most of the lipid content of a low-oil fish with a low-oil content will be phospholipid while in a fish high in oil a much lower percentage of its total oil will be phospholipid.

The work is under the supervision of the Bureau's Technological Laboratory, Seattle, Wash.

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-November 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 11 months of 1962 was 45,879 short tons (or 9.7 percent) greater than during the same period of 1961. Domestic production was 7,126 tons (or 2.6 percent) greater and imports were 38,753 tons (or 19.9 percent) greater than in the same 11 months of 1961. Peru continued to lead other countries with shipments of

U. S. Supply of Fish Meal and Solubles, Jan.-Nov. 1961-62 and Total for 1961			
Item	Jan.-Nov.		Total
	1/1962	1961	1961
..... (Short Tons)			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	243,531	238,144	247,551
Tuna and mackerel	19,411	19,190	21,243
Herring	3,533	5,268	5,268
Other	19,225	15,972	37,203
Total production	285,700	278,574	311,265
Imports:			
Canada	40,550	35,861	38,218
Peru	173,099	132,321	151,439
Chile	8,475	10,738	12,074
Angola	-	1,543	1,543
So. Africa Republic	9,984	12,626	13,026
Other Countries	1,222	1,488	1,545
Total imports	233,330	194,577	217,845
Available fish meal supply ..	519,030	473,151	529,110
Fish Solubles:			
Domestic production ^{2/} ...	121,802	107,305	112,241
Imports:			
Canada	1,286	935	1,001
So. Africa Republic	1,717	1,097	1,351
Other Countries	2,918	4,235	4,387
Total imports	5,921	6,267	6,739
Available fish solubles supply	127,723	113,572	118,980

1/Preliminary.

2/50-percent solids. Includes production of homogenized condensed fish.

173,099 tons during the first 11 months of 1962--40,778 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-November 1962 was 14,151 tons more than during the same period in 1961. Domestic production increased 13.5 percent, but imports dropped 5.5 percent.

U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, December 1962: United States fish meal and fish oil production in 1962 was lower by 0.1 percent and 2.6 percent, respectively, as compared with 1961. Fish solubles production increased 9.9 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, December 1962					
Item and Period	1962	1961	1960	1959	1958
..... (Short Tons)					
Fish Meal:					
Production ^{1/} :					
December	2,900	12,750	9,185	14,381	14,636
November	11,023	10,058	8,725	10,791	9,749
Jan.-Oct.	274,954	265,497	242,486	250,218	189,230
Jan.-Dec. prelim. totals ^{2/}	288,877	289,039	257,969	275,396	216,510
Jan.-Dec. final tots.	-	311,265	290,137	306,551	248,140
Imports:					
December	-	23,268	15,564	5,508	8,490
November	11,904	25,649	6,149	3,673	6,082
Jan.-Oct.	221,426	168,928	109,848	123,744	85,780
Jan.-Dec.	-	217,845	131,561	132,925	100,352
Fish Solubles:					
Production ^{3/} :					
December	1,600	4,936	2,897	5,429	6,305
November	4,147	5,140	3,524	4,628	8,888
Jan.-Oct.	117,655	102,345	92,508	155,302	114,984
Jan.-Dec. totals ..	123,402	112,254	98,929	165,359	130,177
Imports:					
December	-	472	60	420	5,180
November	435	3,649	282	3,089	867
Jan.-Oct.	5,486	2,618	2,832	23,121	8,520
Jan.-Dec. totals ..	-	6,739	3,174	26,630	14,567
..... (1,000 Gallons)					
Fish Body Oils:					
Production:					
December	47	1,488	1,038	1,865	1,839
November	1,027	1,360	1,202	1,147	1,028
Jan.-Oct.	31,524	30,522	24,385	21,352	18,555
Jan.-Dec. prelim. totals ^{4/}	32,598	33,471	26,690	24,418	21,625
Jan.-Dec. final tots.	-	34,409	27,853	24,945	21,977
Exports:					
December	-	1,398	2,108	2,611	383
November	23	190	1,952	813	2,037
Jan.-Oct.	16,361	14,743	15,095	15,840	10,119
Jan.-Dec.	-	16,331	19,154	19,264	12,539

1/Does not include crab meat, shrimp, and misc. meals.

2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.

3/Includes homogenized fish.

4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 are preliminary.

Production, December 1962: Preliminary data on U. S. production of fish meal, oil, and



Chemist is determining the temperature of press cake being discharged from the screw press in a Moss Point, Miss., industrial fishery products plant.

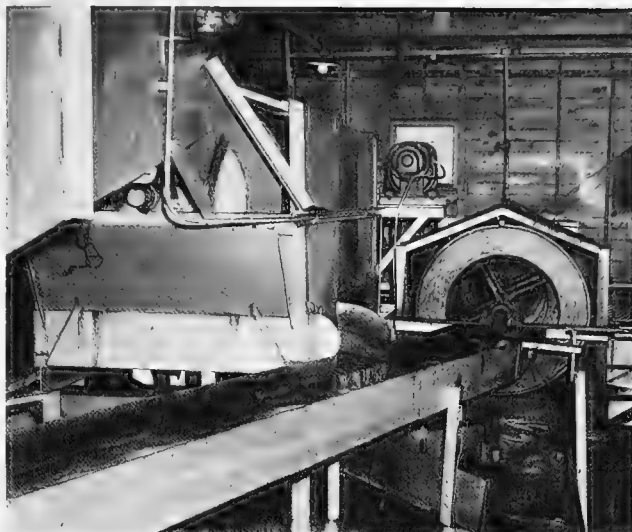
U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, December 1962 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homog- enized ^{2/}
	Short Tons	1,000 Gallons	Short Tons	Short Tons
December 1962:				
East & Gulf Coasts. .	886	13	199	132
West Coast ^{2/}	1,993	34	1,232	-
Total.	2,879	47	1,431	132
1/ Does not include crab meal, shrimp meal, and liver oils.				
2/ Includes Hawaii, American Samoa, and Puerto Rico.				
3/ Includes condensed fish.				

solubles for December 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

* * * * *

Production, January-November 1962:
Preliminary data on U. S. production of fish meal, oil, and solubles for November 1962 as

Table 1 - U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, November 1962 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homog- enized ^{3/}
	Short Tons	1,000 Gallons	Short Tons	Short Tons
November 1962:				
East & Gulf Coasts	9,307	962	3,019	544
West Coast ^{2/}	2,449	61	1,411	-
Total.	11,756	1,023	4,430	544
1/ Does not include crab meal, shrimp meal, and liver oils.				
2/ Includes Hawaii, American Samoa, and Puerto Rico.				
3/ Includes condensed fish.				



Menhaden from the fish pumps are separated from the pump water in the rotary sieve of an industrial fishery products plant in Moss Point, Miss.

collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in table 1.

During November 1962, a total of 11,000 tons of fish meal and scrap and 1 million gallons of marine-animal oils were produced in the United States. Compared with November 1961, this was an increase of nearly 1,000 tons or 9 percent in meal and scrap production, but a drop of 341,000 gallons or 25 percent in oil (Table 2).

Menhaden meal amounted to 8,100 tons--accounting for 74 percent of the November 1962 meal total. Oil from menhaden (nearly 1 million gallons) comprised 93 percent of the November 1962 oil production.

There were 4,100 tons of fish solubles produced in November 1962--100 tons below the same month of the previous year. There were 54 tons of homogenized condensed fish produced in November 1962 as compared with 945 tons in the same month in 1961.

During the first 11 months of 1962, domestic meal and scrap production totaled 286,000 tons--7,400 tons above the same period of 1961. The marine-animal oil yield totaled 32.6 million gallons--a drop of 365,000 gallons as compared with the same period in 1961.

Table 2 - U. S. Production of Fish Meal, Oil, and Solubles, November 1962 with Comparisons

Product	November		Jan.-Nov.		Total
	1/ 1962	1961	1/1962	1961	1961
..... (Short Tons)					
Fish Meal and Scrap:					
Herring	-	175	3,533	5,268	5,268
Menhaden 2/	8,120	6,799	243,531	238,144	247,551
Sardine, Pacific	13	697	743	1,868	2,518
Tuna and mackerel	2,241	1,999	19,411	19,190	21,243
Unclassified	649	401	18,759	14,104	14,757
Total	11,023	10,071	285,977	278,574	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	4,093	4,195	111,283	95,955	100,551
Homogenized condensed fish	54	945	10,519	11,350	11,690
..... (Gallons)					
Oil, body:					
Herring	-	10,000	647,180	817,547	818,017
Menhaden 2/	953,792	1,223,646	30,539,647	30,002,628	31,355,570
Sardine, Pacific	950	20,923	23,589	61,323	86,167
Tuna and mackerel	57,566	89,010	577,179	675,870	762,509
Other (including whale)	14,211	23,998	763,796	1,359,520	1,386,542
Total oil	1,026,519	1,367,577	32,551,391	32,916,888	34,408,805

1/Preliminary data.

2/Includes a small quantity produced from thread herring.

3/Not available on a monthly basis.



Irradiation Preservation

JOINT IRRADIATION STUDIES ON CRAB MEAT AND OTHER FISH PRODUCTS UNDER WAY IN SEATTLE:

Joint irradiation studies on crab meat and other fishery products are being conducted by the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries and the University of Washington under a contract from the U. S. Atomic Energy Commission. The two-phase study program is being conducted in the University's School of Fisheries. The University study group is primarily interested in the bacteriological and biochemical facets of irradiation and the Bureau's Seattle Laboratory group is interested in the commercial feasibility of preservation of fishery products through pasteurization by irradiation.

Both groups make use of Research Irradiator M. K. II, which has 31,000 curies of cobalt from Oak Ridge, Tenn., in 120 small rods nine feet below a shield of de-ionized water.

Crab meat and other fishery products to be irradiated are placed in hermetically-sealed containers and lowered to the bottom of the tank. The length of gamma ray bombardment is carefully timed. Crab meat can be kept fresh after irradiation for up to 28 days and there is no danger from eating any of the irradiated foods. Both of the study groups have eaten irradiated crab meat which was old enough to be thrown out. The consensus of opinion was that "freshness" was preserved and the crab meat was delicious.

Note: See Commercial Fisheries Review, October 1962 p. 25; April 1962 p. 24.

* * * * *

NEW CONTRACT INCLUDES STUDIES ON THE PRESERVATION OF COD, POLLOCK, AND OCEAN PERCH BY LOW-LEVEL IRRADIATION:

Under a new contract with the Atomic Energy Commission, the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., will attempt to find out if cod, pollock, and ocean perch fillets can be successfully irradiated (irradiation pasteurization) and also the maximum acceptable refrigerated shelf life.

Other plans are for new applied and basic investigations into flavor and odor of irradiated seafood. To develop an objective test for quality it is necessary in the more applied aspect of this study to correlate the results of gas chromatography on volatiles from irradiated and nonirradiated fish and sensory evaluations.

The fundamental part of this study will concentrate on methods for collecting and analyzing volatiles present in irradiated and nonirradiated fish. Investigations will also be conducted to determine if new compounds result because of irradiation, and if they do, attempts will be made to define them. The first irradiation, taste tests, and storage experiments on the cod, pollock, and ocean perch fillet series were scheduled for mid-December 1962.

Note: See Commercial Fisheries Review, January 1963 p. 37.

* * * * *

ATOMIC ENERGY COMMISSION APPROVES EXPANSION OF STUDIES ON FISHERY PRODUCTS:

To determine suitable packaging material for radiation-pasteurized products and the effect of pre-irradiation quality level on post-irradiated storage life are the objectives of expanded radiation preservation studies for fishery products at the Gloucester, Mass., Technological Laboratory of the U. S. Bureau of Commercial Fisheries. Support for the studies has been provided by the U. S. Atomic Energy Commission.

The present program at the Laboratory includes quality studies of irradiated cod, pollock, and ocean perch. The studies are very important in that this entire program will substantially benefit the semicommercial-scale radiation studies that follow.

Funds have also been approved in the current Commission's budget to implement commercial-scale studies in 1965 as construction is completed on a \$600,000 marine products irradiator capable of processing 1,000 pounds of fish a day. This irradiator will be located adjacent to the Bureau's Laboratory and will be operated by Bureau employees under a contract with the Commission.

The eventual aim of this research work is to develop the necessary information to stimulate commercial use of radiation pasteurization in extending the shelf life of fresh

fish and to demonstrate the economic feasibility of this process to the fishing industry. It is anticipated that eventually housewives in inland cities will be able to purchase irradiated unfrozen marine fish species of high quality.



New England Fisheries

BOTTOMFISH AND SEA SCALLOP FISHERIES YIELD FORECAST FOR 1963:

The abundance of bottomfish (haddock, cod, whiting, ocean perch, and yellowtail flounder) on New England fishing banks will show little change during 1963, but the abundance of sea scallops will decline, the Director of the North and Middle Atlantic Region of the U. S. Bureau of Commercial Fisheries stated on December 27, 1962. This forecast is based on information provided by biologists of the Bureau's Woods Hole Biological Laboratory who monitor the landings of commercial fishermen and study the populations of fish and shellfish on offshore fishing banks by sampling with fishery research vessels.



Fig. 1 - Mending the otter trawl aboard one of larger Boston, Mass., vessels. This method of fishing is important for groundfish (cod, haddock, pollock, and hake) and flounders in all North Atlantic countries.

Haddock landings in New England in 1962 will approximate 115 million pounds, about the same as in 1961. The Georges Bank stocks of haddock which provide the bulk of the New England landings are expected to remain in good supply during the first half of 1963, but small haddock or scrod abundance will drop during the summer. The 1960 age group which

enters the fishery in 1963 as 2-year-old fish appears to be weak and the following age groups, those of 1961 and 1962, are also weak, according to research vessel surveys. Therefore, abundance is expected to decrease after 1963.

Landings of cod in 1962 will be about 34 million pounds, an increase of 3 million pounds over 1961; making 1962 one of the biggest cod years in recent history. The outlook for cod in 1963 is very good. There is an abundance of young fish on the banks which should guarantee good catches in the coming year.

Landings of whiting for food in 1962 will reach at least 70 million pounds, an increase of about 5 million pounds over 1961. No significant change in whiting abundance is anticipated for 1963.

Yellowtail flounder are very abundant on the banks at present. The landings in 1962 were expected to reach 50 million pounds, up about 16 million pounds over 1961 and one of the largest in history. Abundance will continue high in 1963 since the present populations of yellowtail are composed of good numbers of young fish which will increase in weight during the year and contribute heavily to the landings throughout 1963.

Landings of ocean perch or redfish in the United States in 1962 will total about 122 million pounds, the lowest annual catch since 1944. This is about one-half the average landings for the years 1948-51, the peak period in the United States fishery. About 25 percent of the 1962 landings came from the Gulf of Maine, the remainder was mostly from Nova Scotia's banks and the Grand Banks, with practically nothing from the Gulf of St. Lawrence. The recent decline in ocean perch landings is due chiefly to a decrease in fishing effort. The abundance of that fish is holding fairly steady. Thus, landings in 1963 will depend largely on the amount of fishing conducted for that species.

Sea scallops have been unusually abundant during the past few years, but the high abundance is dropping off. United States landings in 1962 will be about 22 million pounds of scallop meats, down about 2 million pounds from 1961. The recent high abundance of sea scallops on Georges Bank was due to a very large age group coming into the fishery in 1959. This age group is now passing out of the fishery and no new age groups of any



Fig. 2 - A scallop fishing vessel docked at New Bedford, Mass.

strength have appeared. Abundance of commercial sizes of sea scallops on Georges Bank is now appreciably lower than it was in 1961. Furthermore, survey cruises by Bureau research vessels failed to turn up any significant number of very young scallops that might enter and support the fishery in the next year or two. Unless new beds are found, there probably will be a definite decline in scallop landings in 1963 and later.



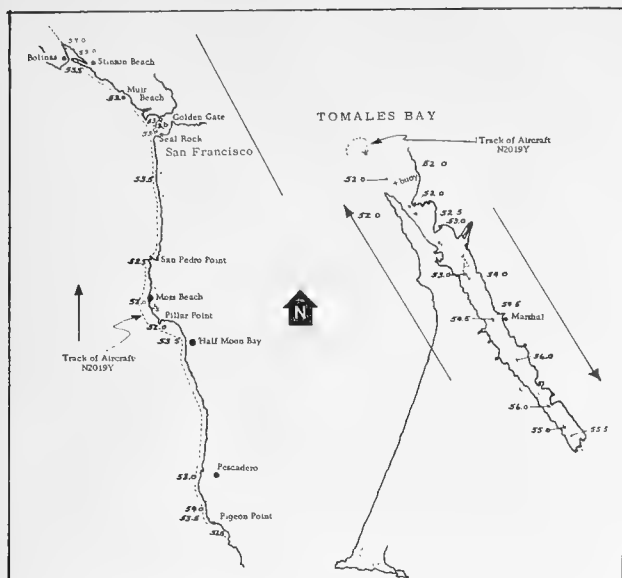
Oceanography

SEA SURFACE TEMPERATURES COLLECTED BY AIRBORNE INFRARED RADIOMETER:

The use of airborne infrared radiometry as a rapid method of obtaining sea surface temperatures was tried by the U. S. Bureau of Sport Fisheries and Wildlife Tiburon Marine Laboratory in California.

In November 1962 an infrared radiometer and supporting electronic equipment (power supply, recording instrument, intervalometer, voltmeter) were installed in a Cessna 172 aircraft. After installation, a series of preliminary tests were made with the airborne unit.

Initial experiments consisted of laboratory observations, calibration of the recording equipment, and flight checks to determine the accuracy of the infrared radiometer. A series of water surface observations was made at several



Aerial infrared sea surface temperatures for Bolinas Bay to Pigeon Point, November 13, 1962.

elevations with the airborne unit and compared with simultaneous observations taken at the water level. Accuracy of $< -0.5^{\circ}$ F. error was obtained for elevations to 1,500 feet from mean sea level (M. S. L.). Repeatability tests were made over Tomales Bay, where differences of surface temperature were available over a short geographical distance. A flight track from the upper Bay to over the ocean and return indicated repeatability of surface water measurements taken at selected points along the flight track.

During flight operations in the Tomales Bay area, off San Francisco, from Santa Barbara to San Diego, and in the Monterey Bay area, sea surface temperatures were recorded by visual readout and with the aid of a strip chart recorder. Visual readouts were made off selected geographical points, and the chart recorder (30 observations per minute) was operated during portions of the flights. The flight track was a half mile off-shore and at elevations of 500 to 1,000 feet.

Of interest is the slightly warmer near-shore water from Santa Barbara to Ventura and from east of Long Beach to Dana Point. The cooling water discharges from the generator plants at Los Alamitos and near Huntington Beach are well defined by increases in surface temperature of up to 10° F.

Immediate plans are to conduct, in co-operation with the California Department of

Fish and Game, water surface temperature observations on the Sacramento River System in relation to the spawning of salmon. Also, plans are being formulated to study the effect of temperature changes in the marine environment on the distribution of schooling fish.

* * * * *

SECOND RESEARCH VESSEL LAUNCHED BY COAST AND GEODETIC SURVEY:

The new U. S. Coast and Geodetic Survey hydrographic and oceanographic research vessel Whiting was launched on November 20, 1962, at a Point Pleasant, W. Va., shipyard.

The Whiting is the second research vessel to be launched recently and is identical to the Peirce, which was launched on October 15, 1962. The two vessels were built under the same contract, totaling \$3,733,040.

Known as a Class III, Coastal Survey Vessel, the Whiting measures 163 feet in length and carries a complement of 6 officers and 30 crewmen. She will be deployed primarily along the southeastern seaboard of the United States and in the Gulf of Mexico. The vessel, propelled by twin-screw 800 ship hp. Diesel engines with controllable pitch propellers, has a sustained cruising speed of 12.5 knots and a total displacement weight of 760 tons.

The Whiting has the latest electronic, navigational, and surveying equipment available. This includes Hi-Fix and Shoran navigational Systems, hydrographic winches, and an oceanographic laboratory--a facility which is unique for a vessel of this class. Two auxiliary



Artist's drawing of the Whiting, one of the new Coast and Geodetic Survey vessels.

power craft will be carried on board the Whiting to assist in inshore hydrographic work and supplemental surveys. Like her sistership, the Peirce, this vessel has a reinforced steel hull to cope with ice conditions.

The Whiting commemorates one of the most illustrious men employed in the long history of the Coast and Geodetic Survey who came to work for the Survey in 1838, at the age of 17. For nearly 60 years, until his death in 1897, he remained in the Federal service to become one of the leading scientists of the Nation, and an expert in his profession of topographic surveying. His professional excellence in topography was internationally respected during his lifetime.

The Whiting will replace the Cowie, built in 1927, and now in a poor state of repair. The Whiting will make Norfolk, Va., her home port.

Note: See Commercial Fisheries Review, November 1962 p. 36.



Oregon

REGULATIONS ON SHRIMP AND BOTTOM FISHING FOR 1963:

The decision of the Oregon Fish Commission to ease restrictions on the harvest of bottom fish and leave unchanged the regulations on shrimp fishing was announced on December 13, 1962.

The new regulations on bottom fish increase the tolerance limit on petrale sole landings from 3,000 to 6,000 pounds per trip during the winter period, January 1-March 31. The number of petrale sole landings per month will continue unrestricted. Gear restrictions were modified to permit a reduction in the minimum wing and body mesh size of trawl nets from $4\frac{1}{2}$ to 4-inch stretched mesh between knots. Minimum size of the mesh in the cod end and intermediate sections remains $4\frac{1}{2}$ -inches as at present. Permissible minimum mesh size for the chafing gear that surrounds and protects the cod end was changed from 12 to 9 inches between hog rings.

Shrimp may be commercially harvested in Oregon waters at any time by means of a beam or shrimp trawl. A mesh size of not less than $1\frac{1}{4}$ inches nor more than 2 inches stretched measure between knots may be used.

The action of the Commission followed a public hearing on December 12, 1962.

* * * * *

RECORD NUMBER OF SILVER SALMON EGGS TAKEN BY HATCHERIES IN 1962:

A new all-time high of 39 million silver salmon eggs was taken by Oregon Fish Commission hatcheries in 1962, according to the Commission's Director of Fish Culture. All the salmon eggs were taken from streams on which the hatcheries are located. The ten-year average take of silver salmon eggs prior to 1962 was 10.7 million eggs.

The Director attributed this new record to several factors. First, in 1958, hatchery practices were modified to include pasteurizing all salmon byproducts which are an item in the beginning diet. This practice virtually eliminated kidney disease, one big obstacle to rearing healthy salmon. It was found that the disease was being transmitted to the young fish in the ground-up salmon carcasses being fed prior to that time. (This is a disease which affects fish only, and not humans.)

Another factor was the introduction of the Oregon "pellet," a completely balanced diet which is the product of 12 years of cooperative research with scientists at Oregon State University. Beginning in 1958, this pellet has been fed on a full-scale production basis. Extensive studies also indicated that better returns could be obtained if fish were raised to the "fingerling", or yearling, stage rather than liberated as young fry. This practice was initiated and fish have since been raised to yearling size. After the needs of the hatcheries have been met, any additional eggs are hatched and set out as fry in stream areas without natural runs or, in other situations, areas where additional numbers of fish can be supported such as selected coastal lakes with outlets to the sea. These fish which are set out are raised at no cost to the State.

After hatchery procedures were changed in 1958, the resulting egg take in 1961 from the first returning fish was 32.3 million, the largest in 25 years. In addition, 26,000 jack salmon returned, which frequently is a rough indicator of the magnitude of the following year's run. In 1962, in addition to the 39 million eggs collected for the hatcheries, 55,000 jack returned. This has caused some

problem to hatchery operations, as the bulk of the jacks are males and are not utilized. Studies are now being planned to see if operations can be changed so those fish will return as full-grown adults.

In addition to the egg take, in 1962 enough fish were passed above hatchery racks to account for 4.6 million more eggs, more than enough to seed all available natural spawning area.

In 1959, a total of $6\frac{3}{4}$ million fingerlings was released into coastal and Columbia River tributaries, and the record 39 million eggs were taken from the surviving spawners. In 1960, 8 million fingerlings were released and all factors considered, another big year for silver salmon returns can be expected in 1963.

"All of the Commission hatcheries rearing silvers had higher returns than in the past several years," the Director stated, "and the largest single hatchery egg take was at Bonneville on the Columbia River with over 7 million." Nearly 7 million eggs were taken at Cascade Salmon Hatchery, a new installation starting operations in 1958 just upriver from Bonneville Dam. Two of the coastal hatcheries, Alsea and Klaskanine, topped the 6-million-egg total.



Pollution

MICHIGAN SELECTED AS THE SITE FOR NEW WATER POLLUTION FIELD LABORATORY:

The selection of the University of Michigan at Ann Arbor, Mich., as the location for a water pollution control field laboratory and research facility to serve the Midwest was announced on January 11, 1963, by the U. S. Department of Health, Education, and Welfare.

The laboratory--one of seven regional facilities authorized by Congress in 1961--will be designed and operated by the Department's Public Health Service.

The University is the fifth site to be selected. Previously announced sites for regional laboratories are Ada, Okla., to serve the Southwest; Corvallis, Ore., to serve the Pacific Northwest; Athens, Ga., to serve the Southeast; and College, Alaska. Yet to be se-

lected are locations in the Northeast and Middle Atlantic states.

The University of Michigan Laboratory will serve the 14-State Great Lakes Region which has some of the most pressing water resources and pollution control problems in the country.

Many of the research projects to be carried out by the Laboratory will be cooperative endeavors making use of the resources of various schools and departments of the University of Michigan, such as the School of Public Health, the Medical School, the College of Engineering, the School of Natural Resources, and the Institute of Science and Technology.

The new facility will have about 50,000 square feet of floor space and will cost over \$2.5 million. It will have a staff of approximately 150 scientists, researchers and engineers.

Note: See Commercial Fisheries Review, November 1962 p. 41.



Salmon

1963 FRASER RIVER CATCH FORECAST:

A 1963 catch of 2.0 to 2.6 million sockeye and 4 million pink salmon from the fishery for Fraser River salmon in North Pacific Convention waters was predicted by the International Pacific Salmon Fisheries Commission in December 1962. The Commission is responsible for maintaining Fraser River salmon and regulates commercial fishing in Convention waters so as to divide the catch equally between the United States and Canada. The sockeye salmon expected to return to the Fraser River in 1963 belong to the "subdominant" cycle of the Chilko Lake and Adams River systems. The Fraser River produces a run of pink salmon once every two years on the odd years.

Severe restrictions on fishing provided adequate escapement for the drastically reduced 1962 run of sockeye salmon to the Adams River (part of the Fraser River system). Spawners arrived on the Adams River in prime condition and at a good time for effective spawning, so the outlook for a bumper crop in 1966 is promising. The near failure of the 1962 run, which was based on parent stock from the great run of 1958, is considered proof that a correlation exists between the rate of flow of

the Fraser River at the time of the young salmon's seaward migration and the size of the homeward migration of mature sockeye. (Facts on Fish, Fisheries Association of B. C., December 1962.)

* * * * *

PACIFIC COAST STATES FORM INTERAGENCY COUNCIL TO SAVE DWINDLING STOCKS:

An interagency council to save the salmon resources of the Pacific Coast States was organized at the close of the Second Governors' Conference on Pacific Salmon on January 10, 1963.



High level fisheries officials of Washington, Oregon, Idaho, Alaska, and California will join Federal officials, University scientists, and industry leaders on the council to coordinate salmon research and take needed steps to preserve the Pacific salmon resources. The Director of the Oregon State Fisheries Department was named chairman. The Executive Director of the Pacific Marine Fisheries Commission was named secretary of the new council. The first meeting will be held at Portland, Oreg., in March of this year.

A prime responsibility of the new council will be to defend the rights of fisheries in the growing competition for water resources of the Western States. Other problems with which the council will be concerned are hydroelectric and industrial plants that bar the salmon from their spawning grounds.



Salmon on their nest.

A starting point for the new council will be an inventory of about 350 current salmon research projects compiled for the Conference by the Seattle Biological Laboratory of the U. S. Bureau of Commercial Fisheries. Plans call for the Pacific Marine Fisheries Commission to circulate research project plans in advance. The Commission will also distribute results from research projects before formal publication and will coordinate salmon catch statistics from all the West Coast States. A long list of research projects and other needs was submitted to the Conference at its closing session.

This January 1963 Governors' Conference on Salmon held in Seattle, Wash., was the second called in two years by a Pacific Coast State governor in efforts to solve the salmon crisis. The first one met in Juneau, Alaska, in 1960.



Shellfish

NEW YORK CITY PROPOSES REGISTRATION FEES FOR SHIPPERS AND PROCESSORS OF SHELLFISH:

The New York City Board of Health is considering a recommendation to charge annual registration fees of \$25 to shippers of shellfish and crab meat and \$15 to processors of shellfish for shipment into the City of New York. At present no fees are charged.

The proposed fees are designed to cover some of the inspection, laboratory, and administrative costs involved in servicing this registration.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, DECEMBER 1962:

Item and Period	1962	1961	1960	1959
... (1,000 Lbs., Heads-Off) ...				
Total landings, So. Atl. and Gulf States:				
March	3,317	4,754	4,098	2,950
February	4,125	3,910	3,785	3,227
January	3,828	5,686	5,401	4,310
December	8,500	6,538	7,097	8,716
January-November .	96,600	84,858	133,938	121,943
January-December .	105,100	91,396	141,035	130,659

(Table continued on following page.)

Item and Period	1962	1961	1960	1959
.... (1,000 Lbs., Heads-Off)				
<u>Quantity canned, Gulf States^{1/}:</u>				
March	94	38	128	93
February	263	98	223	135
January	536	199	289	308
December	1,979	889	977	1,278
January-November ..	22,000	14,904	27,617	23,401
January-December ..	23,979	15,793	28,594	24,679
<u>Frozen inventories (as of end of each mo.)^{2/}:</u>				
March 31	16,607	31,345	23,232	24,893
February 28	19,012	37,612	29,063	27,555
January 31	21,328	37,842	34,332	30,858
December 31	28,372	19,755	40,913	37,866
November 30	27,500	20,668	37,264	37,334
October 31	21,315	17,811	31,209	33,057
September 30	12,843	13,361	24,492	26,119
August 31	12,754	12,728	20,171	23,780
<u>Imports^{3/}:</u>				
March	9,658	10,347	8,545	8,492
February	10,599	8,932	7,657	7,481
January	12,907	12,338	8,596	8,238
December	4/	15,442	12,411	10,611
November	17,964	14,852	13,516	10,269
January-October ..	107,622	95,974	87,491	85,675
January-December ..	4/	126,268	113,418	106,555
. (¢/lb., 26-30 Count, Heads-Off)				
<u>Ex-vessel price, all species, Gulf Ports:</u>				
March	80.9	56.0	56.3	67.6
February	78.9	53.5	51.8	69.6
January	76.3	52.5	49.4	70.9
December	5/83-93	75.2	54.2	48.4
November	5/78-93	73.5	54.0	46.2
Aug., Sept., & Oct. .	5/88-100	68.3	52.4	45.8
May, June & July ..	83.1	54.5	58.1	54.0
<u>Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:</u>				
March	94-95	69-71	65-68	81-83
February	93-95	69-71	65-67	82-87
January	91-94	69-71	64-66	86-88
December	101-109	91-92	68-70	64-66
November	105-110	89-92	69-73	60-65
Aug., Sept., & Oct. .	106-118	76-91	64-73	59-64
May, June, & July ..	96-104	67-75	72-77	62-76

^{1/} Pounds of headless shrimp determined by multiplying the number of standard cases by 33.
^{2/} Raw headless only; excludes breaded, peeled and deveined, etc.
^{3/} Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
^{4/} Not available.
^{5/} Range.
 Note: Data for 1962 and 1961 are preliminary. December 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

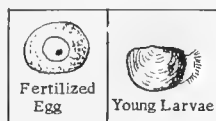


South Carolina

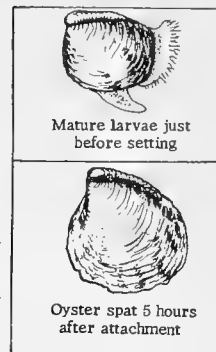
FISHERIES BIOLOGICAL RESEARCH PROGRESS, SEPTEMBER-DECEMBER 1962:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for September-December 1962:

Oyster Studies: The mapping and study of subtidal oyster beds was continued during the quarter. Under the present State law only



oyster beds which are intertidal are subject to lease and conservation practices prescribed by law. The importance of the subtidal beds as disclosed by this mapping study indicates that some management program, and perhaps some legal conservation features, should be added to the existing laws.



The December cold wave which invaded the entire Southeast had little effect on the intertidal oysters. Even though the oysters were exposed during the time of low water to temperatures as low as 10° F. to 12° F., no noticeable kill of oysters resulted. Apparently the insulating ability of the shells was able to protect the oysters during the time of exposure between the tides.

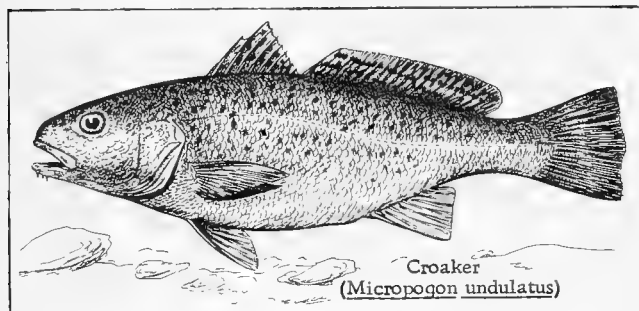
Shrimp Studies: The experimental trawling program for 1962 was completed in December 1962. Data from trawl records for the October-December quarter indicate little change in the abundance of white shrimp as compared with the same period in 1961. The catch per unit of effort for white shrimp during both those quarters was considerably less than the October-December period of 1960, however.

The commercial shrimp catch in South Carolina was several hundred thousand pounds less in October and November 1962 than in that period of 1961, and well below the average catch for those two months in 1959 and 1960. On the whole, however, the shrimp catch in 1962 has been considerably better than in 1961. Through November 1962, approximately 6.3 million pounds of shrimp (heads on) were landed. This is an increase of about 2½ million pounds over the 1961 catch for the same period. The increased commercial catch in 1962 was due largely to the abundance of brown shrimp early in the season.

A cold spell in mid-December brought about a sudden drop in water temperatures throughout the inshore area. During that time water temperatures dropped as low as 41.5° F. No mortality was noted among the shrimp population, although the decreased temperatures apparently did cause a rather sudden migration of the remaining small shrimp in tidal creeks and rivers to the

deeper waters of sounds and offshore. One week after the beginning of the cold spell, shrimp and fish became very scarce in experimental trawl hauls in inside waters, indicating a general migration to the deeper outside waters.

Finfish: Shrimp survey records during the quarter revealed that croaker increased in abundance by almost eight times as compared to that period of 1961. Spot showed little change in abundance for the two quarters, but were slightly more plentiful during October-December 1962.

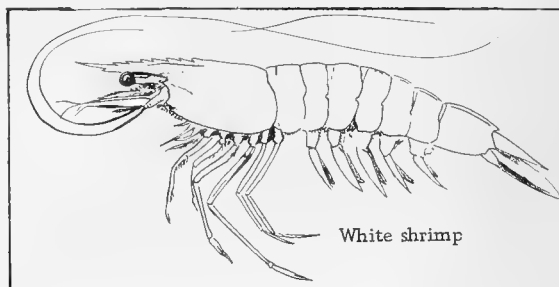


Apparently the only mortality caused by the December cold wave was to fish remaining in shallow waters. Several scattered reports of such kills were made. One report on December 14 indicated that several hundred large winter trout were killed by cold in a small shallow creek entering the Stone River. Another report on December 17 stated that several dead trout and other fish were found in a small canal off Harbor View Road on James Island. Many small 6- to 9-inch trout in shallow experimental ponds at Bears Bluff were killed by low-water temperatures on December 11 and 12. All of those kills, however, took place in very shallow water, and it seems unlikely that any mortality occurred in the deeper creeks and rivers.

Pond Cultivation: Three pond cultivation experiments were completed in October 1962. Results of those experiments were most encouraging and have added valuable information to the knowledge of shrimp culture.

One experiment involved the one-acre "Oyster Pond" which had been drained previously in late June. The floodgates and overflow of that pond were then screened with quarter-inch wire screening and the pond was allowed to fill on the flood tide with water from the nearby creek. This pond was then completely closed off to tidal

influence and stocked by hand with juvenile shrimp. During the period of July 18 to August 24, 1962, over 8,000 white shrimp, averaging about three inches in length



were caught in nearby creeks by cast net and stocked in the pond. On August 8, 1962, the pond was treated with rotenone to remove predatory fish. Crab pots were used in the pond throughout the cultivation period to remove crabs. After stocking, the shrimp in the pond were fed on chopped crabs and fish, beginning at the rate of 5 pounds per week and increasing to a maximum of 40 pounds per week previous to harvesting. About 325 pounds of chopped food was placed in the pond during the experimental period.

When the pond was drained on October 18, 240 pounds of shrimp were harvested. The shrimp were about 65 count, heads off. Only a few pounds of crabs and fish were harvested, indicating that the predator control had been effective.

This experiment had been set up to determine the maximum production per acre of a shrimp pond under controlled conditions. Although a good yield of shrimp was obtained, it was felt that production could be improved by increasing greatly the amount of shrimp food. A similar experiment will be carried out in 1963 to determine the effects of increased feeding on shrimp production.

As a comparable experiment to the one above, the one-acre "Fish Pond" was drained also in late June and the same methods of predator control, feeding, etc., were used as for the "Oyster Pond." However, no screens were placed on the floodgates and the gates were allowed to remain open for tidal flow from June 26 to August 1, 1962. The pond was thus allowed to stock naturally with postlarval and juvenile shrimp, and no stocking was done by hand. On October 18, 1962, when the pond was drained, 146

pounds of 47 count (heads on) shrimp were harvested, along with only a very few pounds of fish and crabs.

In a third experiment, a small one-tenth acre pond was used. The pond had been drained, screened, and refilled early in the year and was then closed off completely and stocked with postlarval shrimp from plankton tows during the period of June 25 to August 8, 1962. The pond was treated with rotenone in August and was drained on October 29. About eight pounds of shrimp and almost no fish were harvested. Although the equivalent per-acre yield for the pond was only about 80 pounds, the experiment indicates that the method of stocking used may have possibilities.

Construction of a $2\frac{1}{2}$ -acre experimental pond at Bears Bluff was completed during the quarter. The pond was allowed to fill with tidal water in early November and is being stocked with small winter trout, channel bass, tarpon, and flounder.

Note: See Commercial Fisheries Review, November 1962 p. 45.



Swordfish

NEW LONG-LINE FISHERY OFF SOUTHERN NEW ENGLAND SHOWS PROMISE:

The possibility of using long-line gear for catching swordfish in New England offshore waters was indicated when catches of swordfish were made by the research vessel Crawford of the Woods Hole Oceanographic Institute in 1961. The vessel was on an exploratory cruise fishing for tuna with long



lines. The cruise was made in cooperation with the U. S. Bureau of Commercial Fisheries North Atlantic Fisheries Exploration and Gear Research Base at Gloucester, Mass.

Those catches and limited fishing by Canadian fishermen off Nova Scotia with converted halibut long-line gear led to the Bu-

reau and the Institute undertaking another cooperative cruise using long lines for swordfish. The cruise, made in June 1962 with the Bureau exploratory vessel Rorqual, resulted in the capture of only one swordfish because of the numerous sharks in the fishing area. The sharks were hooked almost immediately after the gear was set.

Cooperative exploratory long-line fishing by the commercial vessel Cap'n Bill III, chartered by the Institute and using the Bureau's long-line gear. Four cruises were made in October and November 1962 in the waters south of Cape Cod, and approximately 26,000 pounds of swordfish were caught. Upon completion of the last experimental charter cruise, the vessel commenced fishing on a commercial basis and, as expected, catches increased considerably.

The Cap'n Bill III as of December 20, 1962, had landed five successful trips consisting primarily of swordfish, but also including a fair number of tuna. The fifth trip by that vessel, which was landed on December 20, last year, indicates the great potential of the new long-line fishery for swordfish. The trip consisting of 366 swordfish and 44 tuna were taken in only nine sets. One set of the long-line gear by the Cap'n Bill III caught 91 swordfish. This trip by the Cap'n Bill III undoubtedly sets a new record for the number of swordfish caught, but not necessarily in terms of weight. A second vessel, the Gulf Stream, entered the long-line fishery for swordfish late in 1962. This vessel by the end of 1962 had landed one partial trip and 4 complete trips of swordfish caught by long-line.

The successful trips made by these two vessels has stimulated interest on the part of other vessel owners. As of the end of 1962, five vessel owners were reported to be planning to enter the long-line for swordfish off New England.

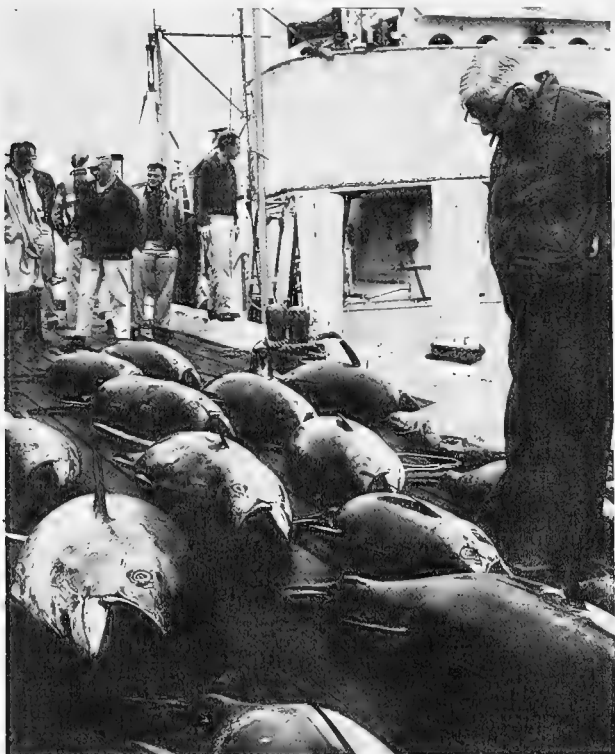


Tuna

TAGGING PROGRAM:

The game fish tagging program by the Woods Hole Oceanographic Institution has been aimed at learning more about the migratory habits and growth patterns of bluefin tuna and other large fish. The Institu-

tion reported on November 9, 1962, that since the start of the program in 1954, scientists and cooperating sportsmen had tagged about 3,000 Atlantic sailfish, 1,300 bluefin tuna, 1,600 white marlin, 225 amberjack, 575 Pacific sailfish, 170 yellowfin tuna, 175 striped marlin, 40 blue marlin, and about 500 fish of various other species. So far, tags have been recovered from 14 Atlantic sailfish, 12 blue-

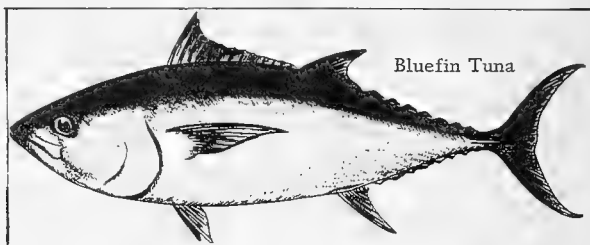


Senior Ichthyologist of the Woods Hole Oceanographic Institution examining a big-eyed tuna brought in along with several medium bluefin by the research vessel Crawford (seen in background).

fin tuna, 2 white marlin, 28 amberjack, and 1 yellowfin tuna, as well as 3 dolphin, 4 striped bass, 2 jack crevalle, 1 bar jack, 1 barracuda, 1 sea bass, and 1 fluke. Over 1,200 individuals have tagged one or more fish in the program.

The outstanding results of the program have been the returns showing five transatlantic migrations of giant bluefin tuna from off Cat Cay in the Bahamas to Norwegian waters. Two bluefin tuna crossed the Atlantic Ocean in 1961 in less than four months. Another made the journey in 1962 in the fantastic time of only 50 days. As only 77 tuna were marked in the Cat Cay area in the years 1960-1962, it seems certain that at least a large fraction of the giant bluefin

passing the Bahamas in those years were migrating to Norwegian waters. This is in marked contrast to the widely held belief that bluefin tuna move from the Bahamas to northwestern Atlantic coastal waters. One



bluefin tuna, in addition to his transatlantic migration, had moved northward through 43 degrees of latitude, from just above the tropics to well inside the Arctic Circle.

The Atlantic bluefin tuna apparently has no home. Successful tagging programs in Norway and Spain have shown bluefin migrations from Norwegian waters to the southern Atlantic coast of Spain, and from there to the Mediterranean coast of France.

A large-scale tagging program is the quickest way to estimate the affect on tuna stocks of the increase in commercial tuna fishing off the Atlantic Coast, according to the scientist in charge of the game fish tagging program of the Institution. For this reason, he recommends intensifying the Institution's current tagging program and expanding the program to include tuna such as yellowfin, blackfin, big-eyed, and albacore, and also oceanic bonito or skipjack.

Note: See Commercial Fisheries Review, February 1962 p. 42.

* * * * *

U. S. CANNED PACK, 1961-1962:

According to preliminary data, the 1962 canned tuna pack in the United States (including Hawaii, American Samoa, and Puerto Rico) was 5.4 percent greater than in 1961--the albacore or white meat pack was up 14.7 percent and the light meat pack was up 2.4 percent. By canning areas, the increase in the 1962 pack was: California, up 2.6 percent; Washington and Oregon, up 15.9 percent; Atlantic Coast, Hawaii, American Samoa, and Puerto Rico, up 9.5 percent.

The discovery of tuna in commercial quantities in New England waters was an important development in 1962. Seven tuna purse-seiners fishing in the Northwest Atlantic between July and October caught about 3,660 short tons of tuna. The development created interest in building canning facilities on the East Coast. One tuna cannery was built in Maryland during the year.

On the West Coast, there was a striking decline in the important domestic yellowfin tuna catch. Yellowfin tuna landings in California amounted to only 63,490 tons in 1962,

U.S. Canned Tuna Pack, 1961-62

Area	1/ 1962			1961		
	White Meat (Albacore)	Light Meat	Total	White Meat (Albacore)	Light Meat	Total
	.....(Standard Cases).....					
California	2,003,000	8,821,000	10,824,000	1,619,071	8,926,497	10,545,568
Wash. & Oregon ...	860,523	601,482	1,462,005	797,261	464,405	1,261,666
Atlantic Coast	238,454	539,623	778,077			
Hawaii, American Samoa, & Puerto Rico	1,360,000	2,200,000	3,560,000	2/ 1,475,099	2/ 2,485,371	2/ 3,960,470
Total	4,461,977	12,162,105	16,624,082	3,891,431	11,876,273	15,767,704

1/Preliminary.

2/Atlantic Coast, Hawaii, American Samoa, & Puerto Rico combined.

down 36.7 percent from landings of 100,189 tons in 1961. Throughout 1962, domestic yellowfin tuna landings lagged behind those in the previous year. In the last three months of 1962, fishermen reported that tuna were extremely scarce in the high-seas fishery off Central and South America. The decline in yellowfin landings was partly offset by increased domestic landings in 1962 of albacore (up 22.2 percent), bluefin (up 54.0 percent), and skipjack (up 25.7 percent). But the increase in the California tuna pack was achieved only because imports of frozen tuna were heavier and an increase in the pack of chunk-style tuna.



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, OCTOBER-DECEMBER 1962:

From the beginning of the program in 1956 through December 31, 1962, a total of 1,221 loan applications for \$34,042,256 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total 645 applications (\$15,122,649) have been approved, 422 (\$10,994,959) have been declined or found ineligible, 136 (\$5,818,677) have been withdrawn by applicants before being processed, and 18 (\$480,634) are pending. Of the applications approved, 258 (\$1,625,337) were approved for amounts less than applied for.

The following fishery loans were approved from October 1, 1962, through December 31, 1962:

North and Middle Atlantic Area: George DePutter, Sr., Brigantine, N. J., \$10,000; Sigvald Osmundsen, Rio Grande, N. J., \$6,000.

South Atlantic and Gulf Area: Eugene E. Lewis, Fernandina Beach, Fla., \$90,000; Walter A. and David M. Tate, Aransas Pass, Tex., \$23,000; Newell F. Allen, Freeport, Tex., \$14,500; Emanuel Nagin, Freeport, Tex., \$17,500.

Pacific Northwest Area: Theodore A. Whittaker, Ilwaco, Wash., \$10,800; Elmer A. Johnson, Poulsbo, Wash., \$7,500; Karl Kaldestad, Seattle, Wash., \$15,000.

Alaska Area: Warder Nelson Stoaks, Elfin Cove, \$4,000; John H. McVicker, Juneau, \$2,000; Richard Z. LeMay, Ketchikan, \$16,000; Carl J. Guggenbickler, Wrangell, \$4,000.

Great Lakes Area: Chambers Bros., Holland, Mich., \$15,000; Robert Peel, Saugatuck, Mich., \$14,500.

Under the Fishing Vessel Mortgage Insurance Program during the fourth quarter of 1962, commitment to insure mortgage in the amount of \$225,000 on a steel trawler was approved for Boston Fishing Boat Company, Boston, Mass. The total approved as of December 31, 1962, under this program (initiated on June 5, 1960) were 12 applications for \$1,710,596, covering 24 vessels. Three applications for \$198,000 were pending at the end of 1962.

In the Construction Differential Subsidy Program, 4 applications for \$190,667 were pending as of December 31, 1962. Two subsidy payments were made during the fourth quarter of 1962, \$35,750 to Thomas B. Larsen, New Bedford, Mass., and \$151,299 to Boston Fishing Boat Company, Boston, Mass. Since

the beginning of the program on June 12, 1960, 5 applications for \$507,646 have been approved for construction of trawlers to operate in the New England groundfish fishery. The amount approved for the subsidy is about one-third of the cost of each vessel.

* * * * *

NEW LARGE STEEL TRAWLER ADDED TO BOSTON FLEET:

The Boston, Mass., fishing fleet added its first large steel trawler in over 12 years, when the 124-foot Massachusetts was delivered to its owner on December 12, 1962. The owner of the new vessel is a corporation made up of 28 Boston area firms and individuals long associated with the ownership or servicing of fishing vessels.

The trawler was built by a Sturgeon Bay, Wis., shipbuilding firm at a cost of about \$454,000. Construction of the new vessel was aided by the Vessel Subsidy Program of the U. S. Bureau of Commercial Fisheries with a grant of about \$151,300. Additional financing amounting to \$225,000 was provided by a large Boston insurance company, and that loan is insured by the Mortgage Insurance Program also administered by the Bureau.

The Massachusetts is being used in the fishery for groundfish (cod, haddock, hake, cusk, pollock, and ocean perch). It has a fish hold capacity of about 250,000 pounds and carries a crew of about 17. Customary fishing cruises last 7 to 9 days in the summer and as long as 12 days in the winter.

An identical vessel is under construction in the same Wisconsin shipyard for a Wisconsin firm which operates out of Boston. This vessel, also being partly financed by the Bureau's Fishing Vessel Subsidy Program, will be completed this spring. It will be another modern addition to the older groundfish fleet which, because of obsolescence, is suffering from the competition of newer vessels operating out of foreign countries.

Under the fishing vessel construction grant program up to one-third of the cost of construction of a fishing vessel can be financed by the Federal Government. This is to offset the lower construction costs on vessels built in foreign shipyards.



U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, THIRD QUARTER 1962:

Airborne fishery imports into the United States leveled off in September 1962 after increasing in July and August due mainly to larger shipments of shrimp. Airborne imports of northern lobsters from Canada dropped to 54,961 pounds in July and then stopped completely. They were replaced by airborne shipments of spiny lobsters from Caribbean and Central American countries which amounted to 115,736 pounds in August and 54,349 pounds in September. Fish fillets from Mexico was the leading finfish product imported by air in the third quarter of 1962.

Raw headless shrimp made up the bulk of airborne shrimp imports--in July, shipments consisted of 617,228 pounds of fresh or frozen raw headless, 56,881 pounds of frozen peeled and deveined, and 95,261 pounds of unclassified shrimp; in August, shipments consisted of 886,496 pounds of fresh or frozen raw headless, 131,510 pounds of peeled and deveined, and 660 pounds of unclassified shrimp; and in September, shipments consisted of 507,023 pounds of fresh or frozen raw headless, 42,056 pounds of frozen peeled and deveined, and 1,500 pounds of unclassified shrimp. Over 80 percent of the airborne shrimp imports in July, August, and September entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Laredo (Tex.), Los Angeles (Calif.), and New York City.

Product and Origin ^{1/}	July		August		September		Jan.-Sept.	
	Qty. ^{2/}	Value ^{3/}	Qty. ^{2/}	Value ^{3/}	Qty. ^{2/}	Value ^{3/}	Qty. ^{2/}	Value ^{3/}
	Lbs.	US\$	Lbs.	US\$	Lbs.	US\$	Lbs.	US\$
Fish:								
Azores	-	-	-	-	25,654	5,672	25,654	5,672
Portugal	-	-	-	-	12,125	3,500	12,125	3,500
Canada	-	-	-	-	-	-	21,317	16,948
Mexico	93,411	12,831	109,582	22,252	138,299	22,246	691,542	121,467
Rumania	124	200	-	-	-	-	1,251	11,287
Panama	-	-	-	-	-	-	7,807	1,312
Norway	-	-	-	-	-	-	223	449
Denmark	99	261	-	-	-	-	99	261
Costa Rica	5,576	861	-	-	-	-	5,576	861
British Honduras ..	-	-	8,775	2,223	5,950	1,428	14,725	3,651
Total fish	99,210	14,153	118,357	24,475	182,028	32,846	780,598	166,071
Shrimp:								
Guatemala	14,125	6,575	62,167	29,638	30,580	15,528	230,175	115,303
El Salvador	77,027	44,272	70,722	39,946	56,957	31,131	467,112	292,757
Nicaragua	100,557	32,633	85,166	27,773	2,671	1,500	979,872	330,158
Costa Rica	37,734	17,137	75,996	31,104	65,274	25,637	378,921	138,828
Panama	170,945	105,262	278,161	144,337	235,804	181,581	1,423,170	776,268
Venezuela	369,382	214,188	446,450	251,752	502,360	253,132	2,482,428	1,343,422
Ecuador	-	-	-	-	-	-	12,210	3,440
Mexico	-	-	-	-	-	-	24,748	9,052
Netherlands Antilles	-	-	-	-	-	-	3,075	2,722
Total shrimp	789,370	420,067	1,018,666	525,150	953,646	550,579	5,950,591	3,011,950
Shellfish other than Shrimp:								
British Honduras ..	9,360	7,114	56,830	29,756	35,682	22,567	177,212	102,301
Honduras	-	-	52,800	32,960	-	-	113,003	80,666
Costa Rica	-	-	-	-	-	-	1,400	1,247
Panama	-	-	-	-	-	-	1,040	1,011
Jamaica	-	-	-	-	-	-	30,014	21,324
Netherlands Antilles	624	283	-	-	15,314	9,823	31,196	19,856
Venezuela	-	-	-	-	-	-	22,263	13,624
Mexico	2,268	1,072	18,699	12,346	3,353	3,120	53,919	33,573
Guatemala	-	-	1,100	710	-	-	8,470	4,580
Leeward and Windward Islands	-	-	-	-	-	-	22,911	8,660
Nicaragua	1,232	548	2,333	1,034	-	-	1,186	555
Japan	-	-	-	-	-	-	26	330
France	37	101	-	-	-	-	361	1,038
Colombia	285	1,264	56	220	-	-	1,763	5,110
Ecuador	700	448	-	-	-	-	1,640	1,152
Canada	54,961	20,740	-	-	-	-	223,442	90,880
El Salvador	-	-	336	237	-	-	831	479
Trinidad	-	-	-	-	-	-	2,338	971
Dominican Republic	6,621	4,830	572	550	14,886	14,844	22,079	20,224
Bahamas	-	-	1,882	837	-	-	1,882	837
Peru	-	-	92	204	-	-	92	204
Tot. shellfish (exc. shrimp)	76,088	36,400	135,496	79,128	69,235	50,354	717,068	408,632
Grand Total	944,668	470,620	1,272,518	628,753	1,204,909	633,779	7,448,147	3,586,553

^{1/}Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States exports with Puerto Rico and with United States possessions and trade between United States possessions are not included.

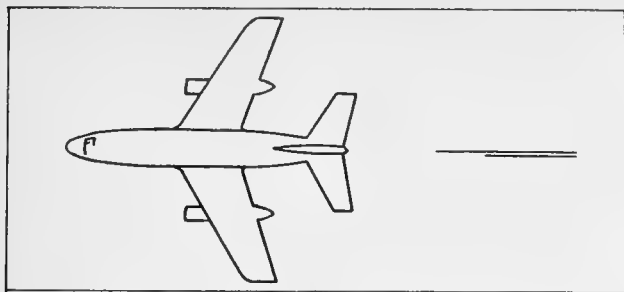
^{2/}When the country of origin is not known, the country of shipment is shown.

^{3/}Gross weight of shipments, including the weight of containers, wrapping, crates, and moisture content.

^{4/}P.o.b., point of shipment. Does not include U. S. import duties, air freight, or insurance.

Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, July, August, and September 1962, U. S. Department of Commerce.



Shrimp accounted for 79.9 percent of the quantity and 84.0 percent of the value of airborne imports of fishery products in the first nine months of 1962. All of the U. S. airborne shrimp imports during the first nine months of 1962 originated in Central and South American countries. The leading suppliers of airborne shrimp imports in January-September were Venezuela with 42.4 percent, Panama with 23.9 percent, and Nicaragua with 16.5 percent.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports is fresh and frozen products.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-December 1, 1962, amounted to 51,796,996 pounds (about 2,466,524 std. cases), according to data compiled by the Bureau of Customs. This was only slightly below the 52,024,510 pounds (about 2,477,358 std. cases) imported during January 1-December 2, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12 $\frac{1}{2}$ -percent rate of duty is limited to 59,059,014 pounds (about 2,812,334 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

EDIBLE FISHERY PRODUCTS, NOVEMBER 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in November 1962 were up 0.8 percent in quantity but down 0.5 percent in value from those of the previous month. A large increase in imports of frozen tuna (increase mostly from Japan and Peru) was about offset by a sharp decline in imports of ocean perch fillets (decline mostly from Canada), canned sardines not in oil (decline mostly from South Africa), and canned oysters (mostly from Japan).

Compared with the same month in 1961, the imports in November 1962 were up 1.4 percent in quantity and 7.1 percent in value. There was a sizable increase in November 1962 in imports of fish blocks or slabs (increase mostly from Norway and Iceland), frozen tuna other than albacore (increase mostly from Japan and Peru), and frozen shrimp. But imports were down for frozen salmon (mostly from Canada), canned salmon (mostly from Japan and Canada), canned sardines in oil and not in oil, and frozen albacore tuna, canned tuna in brine other than albacore.

In the first 11 months of 1962, imports were up 15.3 percent in quantity and 26.1 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed in 1962 for most imported fishery products. Most fishery products were imported in greater quantity in 1962 and imports were up substantially for fish blocks or slabs, frozen tuna (increase mostly from Japan and Peru), canned sardines in oil, frozen shrimp, and sea scallops. Imports were down for the following products: haddock fillets, fresh and frozen salmon, canned salmon, canned albacore tuna in brine, canned bonito and yellowtail, and canned crab meat.

U. S. Imports and Exports of Edible Fishery Products, November 1962, with Comparisons								
Item	Quantity				Value			
	Nov.		Jan. -Nov.		Nov.		Jan. -Nov.	
	1962	1961	1962	1961	1962	1961	1962	1961
	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
Imports:								
Fish & Shellfish:								
Fresh, froz. & processed ^{1/}	102.3	100.9	1,083.2	939.1	36.2	33.8	366.1	302.5
Exports:								
Fish & Shellfish:								
Processed only ^{1/} (excluding fresh & frozen)	3.5	3.9	30.8	23.9	2.0	1.9	13.9	12.1
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.								

^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.

Exports of processed fish and shellfish from the United States in November 1962 were down 2.8 percent in quantity from those in the previous month. But the value of the exports in both months was the same. In November, there was a modest decline in exports of canned salmon, canned sardines in oil and not in oil, and canned squid. The decline was about offset by an increase in exports of canned mackerel and the higher-priced canned shrimp.

Compared with the same month in 1961, the exports in November 1962 were down 10.3 percent in quantity, but up 5.3 percent in value. Exports of canned shrimp and canned squid increased in November, while exports of canned mackerel, canned salmon, and canned sardines not in oil declined.

Processed fish and shellfish exports for the first 11 months of 1962 were up 28.9 percent in quantity, but the value was up only 14.9 percent as compared with the same period of 1961. Exports of the lower priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines in oil. But there was a small decline in exports of canned shrimp (decline mostly in exports to Canada and the United Kingdom) and canned sardines not in oil (decline mostly in exports to the Philippines). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

Wholesale Prices

EDIBLE FISH AND SHELLFISH, DECEMBER 1962:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in December 1962 rose 2.2 percent from the preceding month due primarily to a sharp increase in prices for fresh drawn and filleted haddock at Boston following some extremely bad weather on the New England fishing grounds. As compared with December 1961, prices were up 4.5 percent because of generally higher prices for most of the fishery products included in the index.

The drawn, dressed, and whole finfish subgroup index in December 1962 was up sharply (increased 10.2 percent) from the previous month and up 15.7 percent from December 1961. Much higher prices in December 1962 for large drawn haddock (up 64.9 percent) at Boston plus a 2.3-percent increase for round fresh whitefish at Chicago more than offset a slight decline (1.9 percent) for dressed frozen halibut at New York City. Compared with December 1961, wholesale prices were up quite sharply for all items in the subgroup except those for Great Lakes fresh round yellow pike (down 14.9 percent).

A sharply higher price in December 1962 for fresh small haddock fillets at Boston (up 17 cents a pound or 40.2 percent) was responsible for the increase (3.6 percent) from November to December 1962 in the fresh processed fish and shellfish subgroup index. Fresh shrimp prices at New York City were up slightly (about one cent a pound) from the preceding month and fresh shucked oys-

ters (standards) at Norfolk rose 1.6 percent. The December 1962 subgroup index was up 11.2 percent from the same month of 1961 because of much higher prices for fresh small haddock fillets (up 82.5 percent) at Boston and fresh shrimp (up 14.8 percent) at New York City.

Processed frozen fish and shellfish prices in December 1962 were lower by 3.6 percent from the previous month because of a further decline of 5.1 percent in frozen shrimp prices at Chicago (declined 4.0 percent between October and November 1962). In addition, frozen flounder fillets at Boston dropped 3.7 percent or one cent a pound between mid-November and mid-December 1962. Wholesale prices at Boston from November to December 1962 were unchanged for frozen haddock fillets and only fractionally lower for frozen ocean perch fillets. As compared with December 1961, the subgroup index for December 1962 was up 10.9 percent. Prices in December 1962 were higher by 12.6 percent for frozen shrimp, 8.1 percent for frozen ocean perch fillets, 10.7 percent for frozen haddock fillets, and 2.6 percent for frozen flounder fillets.

Canned fishery products prices in December 1962 were unchanged from the preceding month, but were 9.0 percent lower than in December 1961. Compared with December a year earlier, canned fish prices were lower for all the products in the subgroup index--canned Maine sardines down 24.4 percent, canned light meat tuna down 3.2 percent, canned pink salmon down 8.9 percent, and canned California sardines down 10.0 percent. Packs of canned fish items in this subgroup were all good in 1962, except for California sardines which yielded the lowest pack on record.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			Dec. 1962	Nov. 1962	Dec. 1962	Nov. 1962	Oct. 1962	Dec. 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					120.9	118.3	119.0	115.7
Fresh & Frozen Fishery Products:					127.6	123.7	124.3	113.3
Drawn, Dressed, or Whole Finfish:					133.1	120.8	120.7	115.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.18	.11	143.8	87.2	82.2	109.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.43	.44	127.1	129.6	129.6	105.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.97	.96	135.2	134.5	136.2	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.69	.68	103.0	100.7	108.2	94.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.54	.54	88.5	88.5	77.8	104.0
Processed, Fresh (Fish & Shellfish):					128.5	124.0	123.8	115.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.58	.41	139.6	99.6	92.3	76.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.05	1.04	123.1	121.9	122.5	107.2
Oysters, shucked, standards	Norfolk	gal.	7.88	7.75	132.8	130.7	130.7	132.8
Processed, Frozen (Fish & Shellfish):					116.4	120.7	122.7	105.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.41	100.1	103.9	100.1	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	107.0	107.0	105.5	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.34	117.5	118.3	110.4	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.03	1.09	122.2	128.7	134.0	108.5
Canned Fishery Products:					109.4	109.4	110.2	120.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	25.50	25.50	111.1	111.1	111.1	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	101.6	101.6	118.5	112.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.31	119.4	119.4	116.9	157.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/Recomputed to be comparable to 1957-59=100 base indexes.

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International

EUROPEAN ECONOMIC COMMUNITY

ST. PIERRE FISHING BASE PLANS TAKE SHAPE:

Considerable interest is being shown by fisheries representatives of private industry in the European Economic Community (EEC) countries in establishing a base in St. Pierre for fishing craft belonging to member countries of EEC. Three committees from the fishing industries in the Common Market countries are meeting on the financial and technical phase of the project. The base would serve primarily as a supply and repair port for the Common Market country vessels and as a point of transshipment of catches.

The plan for the project, including establishment of an organization to carry it out, are to be completed by the end of 1963.

Although sitting in on the earlier meetings, Italian representatives have stated they no longer are interested in the project. Places on the committees and in the project are being reserved for Denmark, Norway, and the United Kingdom, if they are interested and become EEC members.

The Directors of the European Economic Community (EEC) Overseas Development Fund are reported to have agreed provisionally to invest about US\$3.5 million in the first stage of the scheme for improving the harbor and fish receiving facilities of Saint Pierre, capital of the St. Pierre et Miquelon Islands, off southern Newfoundland. France, and the territorial government, will invest a further sum for ancillary shore facilities and a private group of French, Belgian, German, and Dutch fish processors will install filleting and cold-storage equipment.

The proximity of this improved facility to the Grand Banks, Newfoundland, and other rich fishing areas, will permit French and other trawlers (possibly including United

States vessels) to use more of their time fishing and less traveling.

The first stages envision lengthening the seawall of the Ile aux Moules and construction of a new, second, freezing plant capable of handling some 18,000 metric tons of fish per year for producing about 5,000 tons of frozen fillets. The frozen storage capacity would be 1,200 tons. An associated factory would produce fish oil and about 2,500 tons of fish meal yearly.

The edible fish products produced by the new facility will be, in the first stage, destined for French and other European markets, but the possibilities of shipments to the United States are also believed to have been considered. (From European Regional Fisheries Attache, United States Embassy, Copenhagen, December 5, 1962; United States Embassy, Paris, December 16, 1962.)

EUROPEAN FREE TRADE ASSOCIATION

COMMITTEE WEIGHS FURTHER TARIFF CUTS:

The European Free Trade Association (EFTA) Consultative Committee, consisting of some 40 industrialists and trade union representatives from the seven member countries and from Finland (an associate member), gave favorable consideration at its December 4-5, 1962, meeting in Oslo to the further reduction of intra-EFTA tariffs. As scheduled, all member countries were to reach the halfway mark in tariff slashes by the end of December 1962, a point which (according to the Stockholm Convention which established EFTA) was to have been reached by January 1, 1965.



Discussing the progress within EFTA and the developments in the field of European in-

International (Contd.):

tegration since the last meeting of the Committee May 24, the Secretary-General noted that the reduction of intra-EFTA tariffs well in advance of the timetable laid down in the Stockholm Convention had been achieved with great advantage to the member nations and without injury to any facet of their economies. The delegates expressed the opinion that the reduction of tariffs should proceed, and requested the EFTA secretariat to make studies concerning a program of further tariff dismantlement.

The delegates discussed the American Trade Expansion Act of 1962, the implementation of which was seen as largely dependent upon some measure of agreement between EFTA and the EEC. The view was expressed that this in itself was an important factor, showing that the Americans were optimistic about the future of European integration.

The delegates felt that continued reduction of intra-EFTA tariffs would be of great help to their individual economies when the time came for integration with the EEC. It was reported that the reductions had already cut prices and stabilized the cost of living, and that further cuts would be even more beneficial to consumers. (EFTA Reporter, December 11, 1962.)

EUROPE

EUROPEAN FISH PRODUCERS ASSOCIATION (EUROPECHE) PLANS FOR FUTURE:

EUROPECHE, an association of national organizations of fish producers in the European Economic Community (EEC) countries, was established in May 1962. The membership is made up of three national organizations of fish producers in West Germany, and one each in Belgium, France, Italy, and the Netherlands. The headquarters office of the Association is located in Brussels, but its Secretary maintains offices in Oostende, Belgium. EUROPECHE aims to reach a common view on fisheries problems resulting from its activities and to make those views known to the EEC organizations.

EUROPECHE hopes to be a liaison organization between EEC or Common Market fish producers and the EEC—especially the EEC Commission. The nine-member Commission must "supervise the gradual establishment of a full Common Market, in which trade restrictions of all kinds will be abolished, and all goods, services, labor, and capital will circulate freely, and in which rules of fair competition are observed. Above and beyond that the Commission must work out and implement common policies for agriculture (includes fisheries), transport, and external trade, and work with the Council of Ministers towards common economic, monetary, and labor policies."

The Association recognizes that the Common Market alone cannot solve its fisheries problems without contact

with other countries. EUROPECHE hoped to accomplish this through a *modus vivendi* with the United Kingdom and other countries. The Common Market Commission did not permit this but did approve of informal contacts between the Chairman of EUROPECHE and fisheries associations in other countries. The latter are kept informed of developments by this means, and have, on occasion, submitted their written views to the Commission through EUROPECHE. Observers from non-EEC countries may not attend EUROPECHE meetings.

The most important EUROPECHE body is the Board of Direction. It was due to meet in Paris the first week in January to develop a EUROPECHE position for the proposed EEC Fisheries Conference, probably to be held in February, possibly in Scheveningen, the Netherlands, or Stresa, Italy. The Chairman of EUROPECHE will attend the Conference together with similar observers from EEC-wide associations of national organizations of fish canners, fish freezers, and fish meal and oil manufacturers. As yet there is no association of national fish marketing organizations.

The first EEC Fisheries Conference may not accomplish much more than an inventory of the problems. Probably the most important discussions will be on fisheries limits and on national subsidies. There does not appear to be unanimity as to whether an EEC fisheries policy should be a fait accompli before the United Kingdom, Denmark, and Norway are accepted as members.

According to the Association's Chairman, the prevailing EUROPECHE view is that, under the Rome Treaty, fishing vessels of EEC countries may fish in each other's territorial waters under the freedom-of-movement provisions. A three-mile fisheries limit is regarded, for example, as merely a three-mile extension of the land boundary. Fishing vessels would, of course, have to abide by the fishing regulations of the contiguous country.

Such freedom of fishing and landing might well lead to "Euroports" for the fishing industry. These would be the ports which provided the best facilities for handling landings and the highest prices for catches because of processing and distributing or marketing advantages. Such ports would draw vessels from all Common Market countries and might affect the present status of fishing ports to a considerable degree. This and other developments are expected to lead to mergers of smaller producing interests to promote efficiency, obtain capital, and thereby better meet competition.

EUROPECHE, as such, is not directly interested in the contemplated Common Market fisheries base in St. Pierre, the French island just off the East Coast of Canada. However, the Vice Chairman and the Secretary are serving on industry committees which are developing plans for the project. (European Regional Fisheries Attache, United States Embassy, Copenhagen, December 19, 1962.)

FISH MEAL

WORLD PRODUCTION, OCTOBER 1962:

World production of fish meal in October 1962 was 31.4 percent greater than in the same month of 1961, according to preliminary data from the International Association of Fish Meal Manufacturers. World production during the first 10 months of 1962 was reported as 1,810,329 metric tons.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

There was a large increase in fish meal production in October in Peru (up 21.1 percent), the United States (up 107.1 percent), Denmark (up 178.2 percent), Norway (up 47.2 percent), and Canada (up 57.5 percent). World fish meal production during the first 10 months of 1962 has been increased by heavier landings of anchoveta in Peru, record landings of pilchards in South Africa, record landings of summer herring in Norway and Iceland, and increased landings of industrial fish in Denmark.

International (Contd.):

World Fish Meal Production by Countries, October 1962			
Country	October		Jan.-Oct.
	1962	1961	1962
	..... (Metric Tons)		
Canada	6,096	3,871	64,832
Denmark	12,641	4,544	84,788
France	1,100	1,100	11,000
German Federal Republic	5,444	5,597	61,998
Netherlands	600	900	4,300
Spain	1,949	2,194	21,725
Sweden	672	581	3,758
United Kingdom	5,564	5,105	62,196
United States	30,491	14,721	249,411
Angola	4,780	5,722	24,675
Iceland	357	1,052	92,762
Norway	11,932	8,108	107,239
Peru	92,353	76,269	819,638
South Africa (including South-West Africa)	2,550	4,600	202,007
Total	176,529	134,364	1,810,329
Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.			

Peru accounted for 52.3 percent of world fish meal production (for countries listed) in October 1962, followed by the United States with 17.3 percent.

During the first 10 months of 1962, Peru accounted for 45.3 percent of total fish meal production, followed by the United States with 13.8 percent and South Africa with 11.2 percent.

FISH OIL

EUROPEAN MARKET IMPROVED IN DECEMBER 1962:

The fish oil market in Europe improved in the last five weeks of 1962, according to reports from West German and Danish fish oil brokers. At the time of the meeting of the International Association of Fish Meal Manufacturers (IAFMM) in London in October 1962, fish oil prices were at their lowest. One thousand metric tons of semirefined Peruvian fish oil were sold for US\$70 per ton (about 3.18 U. S. cents a pound) c.i.f. European port. At the same time German herring oil manufacturers were selling their oil for \$67.50 to \$72.50 per metric ton (about 3.06-3.29 U. S. cents a pound) (ex-factory) German coast.

About mid-December 1962, semirefined Peruvian fish oil was sold by a German broker (c.i.f. European port) for \$88.50 per ton (about 4.01 U. S. cents a pound). The late December 1962 price level was \$88 to \$90 per ton (about 3.99-4.08 U. S. cents a pound) for Peruvian fish oil and German herring oil was sold for \$87.50 per ton (a-

bout 3.97 U. S. cents a pound). Sales of Danish fish oil have shown similar increases. United States menhaden oil was sold in December 1962 to Scandinavia for \$100 per ton (about 4.54 U. S. cents a pound).

The reasons given for the improved market are as follows: (1) the efforts made in London to stabilize fish oil prices at the time of the IAFMM meeting in October 1962; (2) the purchase of 20,000 tons (the last sizable lot from the 1961 production) of whale oil in Rotterdam by a large British firm; and (3) the normal, low production of European fish oil in the winter. (European Regional Fisheries Attache, United States Embassy, Copenhagen, December 21, 1962.)

FOOD AND AGRICULTURE ORGANIZATION

SOUTHWEST ATLANTIC REGIONAL FISHERIES ADVISORY COMMISSION MEETS:

A meeting of the Regional Fisheries Advisory Commission for the Southwest Atlantic of the Food and Agriculture Organization (FAO) met in Rio de Janeiro, Brazil, December 10-14, 1962. This was the first meeting of this Commission since it was created by the FAO Conference at its 11th Session (October-November 1961). The purpose of the Commission is to advise the FAO on fisheries matters in the southwest Atlantic area, and encourage cooperative action in the exploitation of fisheries resources.

Argentina, Brazil, and Uruguay, the countries eligible to be members of the Commission, were represented at the meeting by official delegates and advisers. Observers from Spain, the United States, Japan, Poland, and UNESCO were also present. H. E. Crowther, Assistant Director, Bureau of Commercial Fisheries, represented the United States as an observer.

The meeting, conducted in Spanish only, followed the usual pattern of having plenary sessions for general discussion and the use of working groups to handle specific subjects. Three working groups were formed: 1. Oceanographic-Biological. 2. Technological-Economic. 3. Technical (to discuss FAO technical assistance programs of the three countries).

Delegates of the three countries worked harmoniously throughout the meetings and agreed on the need for cooperation to improve conditions in the fisheries of the South-

International (Contd.):

west Atlantic. Need was stressed for work in oceanography, marine biology, technology, marketing, and the training of personnel.

Delegates expressed a keen interest in the possibility of receiving assistance through the UN Special Fund. It was agreed that the three countries would submit individual proposals to FAO for financing under the Special Fund, but that the countries would cooperate in carrying out the projects through joint use of equipment and trained personnel.

The next meeting of the Commission will be in early December 1963 in Buenos Aires, Argentina, if approved by that government.

JOINT UNITED STATES-JAPAN COMMITTEE ON TRADE AND ECONOMIC RELATIONS

SECOND MEETING HELD IN WASHINGTON:

The second meeting of the Joint United States-Japan Committee on Trade and Economic Affairs was held at Washington, December 3-5, 1962. The purpose of the meeting as expressed in the exchange of notes between the U. S. Secretary of State and the Japanese Minister for Foreign Affairs dated June 22, 1961, was to exchange information and views in order that appropriate measures could be considered "to eliminate conflict in the international economic policies of the two countries, to provide for a fuller measure of economic collaboration, and to encourage the flow of trade."

The Joint Committee's discussions covered the whole range of United States-Japan bilateral economic relationships and dealt also with certain aspects of the economic relations of the two countries with the rest of the world.

Recognizing the close connection between domestic economic conditions and developments in international economic relations, the Committee considered first the current economic situation in the United States and in Japan. It noted that both countries have been making progress in meeting their recent economic problems. The Committee looked forward to the favorable effect on United States-Japan economic relationships of higher levels of economic activity in both countries.

The Committee reviewed the balance of payments positions of the two countries. It

recognized the need to eliminate the deficit in the United States balance of payments, which has its origin in the unique role of the United States in the free world. It noted at the same time that Japan's economic growth, as well as its capability for meeting its international responsibilities, has been periodically threatened by disequilibrium in its balance of payments. It noted the measures being taken by both Governments to restore equilibrium, with special emphasis on export expansion.

The Committee agreed that expanding the volume of world trade would be a controlling factor in dealing with the balance of payments problems of both nations. In the further course of the balance of payments review, the Committee paid special attention to the need for close consultation and cooperation among the major industrial nations with respect to international monetary and financial matters.

In the field of international trade, the Committee emphasized the need for strengthening the multilateral trading system of the free world and for expanding trade between the United States and Japan. The Committee discussed the implications of developments within the European Economic Community for the economies of the United States and Japan. It agreed that an expanding and unified economy in Western Europe, operating on an open and liberal basis, would make a major contribution to the expansion of world trade.

The United States delegation gave a preliminary exposition of the actions the United States expected to take under the recently enacted Trade Expansion Act of 1962. The Japanese delegation welcomed the Act as a reaffirmation of the liberal trading policies of the United States and expressed the hope that it would be the means to the fullest possible extension of open and nondiscriminatory trading in the free world.

The delegations discussed the desirability of a major new negotiation on tariff reductions at the earliest feasible date, to take place under the Articles of the General Agreement on Tariffs and Trade (GATT). They also agreed that tariff reductions arrived at in a new round should be applied in full accordance with the unconditional most-favored-nation clause of the General Agreement and that efforts should be made to secure the participation in the negotiations of all the contracting parties to the GATT on the fullest possible basis. The Committee agreed

International (Contd.):

on the importance of assuring that the value of tariff concessions should not be impaired by quantitative and other nontariff restrictions, whether applied generally or on a discriminatory basis.

In the exchange of views about the bilateral economic relationship between Japan and the United States, Japan's restraints on exports to the United States were discussed and the Japanese delegation expressed the hope that developments in the United States would permit their early relaxation. The Japanese delegation expressed its serious concern over some features of the official procurement policies of the United States Government which have resulted in reduced purchases in Japan. The United States delegation explained the role of these policies in maintaining defense and foreign aid programs, freedom of capital movements, and policies aimed at domestic economic expansion. The Japanese delegation also raised questions with respect to relations in the fields of shipping and aviation. On the part of the United States delegation, emphasis was placed on the importance of further trade and exchange liberalization in Japan.

The Committee discussed in detail mutual problems in the fields of agriculture and fisheries. Attention was paid to the role of natural resources in investment and trade between the two countries, with special mention being given to the possibilities for building upon the close geographic link between Alaska and the Pacific Northwest and Japan.

In examining the economic relations of the two countries with other parts of the world, the Committee welcomed the progress that has been made toward the elimination of discriminatory restrictions on Japan's exports and expressed the hope that remaining restrictions of this kind would be removed at an early date.

The United States delegation expressed the strong support of the United States Government for fuller participation by Japan in the Organization for Economic Cooperation and Development (OECD) and stated that it favored full Japanese membership in that organization in the near future.

The Joint Committee agreed that both Japan and the United States should continue

and coordinate their efforts to assist economic progress in the developing countries. The members reviewed current levels of assistance and expressed their understanding of the urgent need for an expanding volume of financial and technical aid. The delegations also discussed the desirability of expanding the resources of the International Development Association and expressed their intention to support such expansion.

Attention was also given to the need of the developing countries for greater export earnings. The Committee considered that means should be found to provide the developing countries with improved and nondiscriminatory access to the markets of the industrial countries. It was noted that technical assistance might be devoted to improving the marketability of the export products of the developing countries.

In reviewing their deliberations, the members of the Committee unanimously expressed the belief that the annual meetings are of great value in furthering mutually beneficial economic relations between the two countries, to which both governments attach major importance. Both delegations look forward to the continued development of the Committee as an effective instrument to carry out the high purposes for which it was established.

INTERNATIONAL LABOR ORGANIZATION

FISHING INDUSTRY WORK RULES
DISCUSSED AT GENEVA MEETING:

Working conditions in the world's fishing industries were discussed by a special technical committee of the International Labor Organization (ILO), at a December 10-19, 1962, meeting at Geneva, Switzerland.

The objective of the meeting was to lay the groundwork for possible international conventions covering crew accommodations and safety, accident insurance, vocational training, and certificates of competency. If the committee presents draft conventions to the ILO, they will later be considered by the International Labor Conference, which is the periodic meeting of delegates from 104 nations, including the United States, to discuss world labor problems.

Thomas Rice, assistant to the Commissioner, Fish and Wildlife Service, U. S. Department of the Interior, and Charles Jackson, former general manager of the National Fish-

International (Contd.):

eries Institute, participated as members of the committee.

Rice served as a Government member of the committee and Jackson as an employer representative. There are 18 members of this special committee, six each from labor, management, and government, selected from various member nations of ILO.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FIFTH MEETING OF FISHERIES COMMITTEE:

The Fifth Meeting of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) was held in Paris, France, October 22-24, 1962. Seventeen countries and FAO were represented at the meeting. The United States representative was A.W. Anderson, Regional Fisheries Attache for Europe.

Most of the meeting was devoted to a careful review of draft papers on subsidies and other financial supports to fishing industries in Canada, Denmark, Germany, Norway, Portugal, Sweden, Turkey, and the United States. The various reports will be redrafted in accord with modifications offered by the Committee.

A report was also made to the Committee on a proposed meeting of experts to deal with the promotion and harmonization of quality standards for deep-frozen fish. The meeting was scheduled to be held in Hamburg December 17-19, 1962.

The Committee also adopted recommendations to the Council of the OECD regarding the operational program for 1963 and technical assistance in less-developed countries. Program proposals for calendar year 1963 include the following operational projects:

Continuation of activities started in 1962:

1. Promotion of quality standards for deep-frozen fish and the study of their harmonization (i.e., changing present standards of member nations so as to achieve uniform standards of quality for frozen fish within the OECD).
2. Promotion of quality standards for canned fish.
3. Development and improvement in methods encouraging fish consumption. (A study and report on this subject is now in process.)

New activities:

1. Study of economic factors involved in the rational exploitation of the resources of the sea. (This study entails (1) a preliminary analysis of the present situation for, and prospects on, the economic utilization of the resources of the North Atlantic and (2) a synthesis of the results of previous studies in this field and the status of any practical use made of these studies.)
2. Improve commercial information on fisheries. (Includes a study on the establishment of a market-news type service in European countries.)

3. Development of a detailed multilingual nomenclature of the different species of fish and varieties of fish products entering international trade.

The next meeting of the OECD Fisheries Committee is tentatively scheduled for the end of January 1963.

* * * * *

PUBLICATION ISSUED ON SANITARY REGULATIONS FOR FISHERY PRODUCTS:

The fishing industry of the United States and of other nations of the Organization for Economic Cooperation and Development (OECD) should derive assistance from the recent OECD publication, "Sanitary Regulations for Fish and Fish Products." The document is a detailed study of the regulations used by OECD member governments to exercise control over health and sanitary factors in the production of fish and fish products.

The study was undertaken on the assumption that, although sanitary regulations are essential for the protection of the health and welfare of the consumer, it is also possible that the regulations may hinder the free flow of trade. Unless administered in a reasonable and practical manner and unless uniform quality standards are established and accepted by OECD member countries, it is believed that conflicting regulations could be detrimental to the movement of fishery products in international markets.

The OECD instituted the study by investigating the sanitary regulations for fish and fish products in force in the United States, Canada, and the 18 European nations in the organization. In 1960, a special consultant was hired to conduct the study. In December 1961, experts from the OECD countries held a meeting to examine the consultant's draft report; to analyze the scientific, technical, and economic factors which have been responsible for the establishment of the sanitary regulations now in force in member countries; and to determine the practical measures to be taken to establish uniform standards of quality that would be accepted by the member countries. These data presented at the meeting, including the consultant's report and the conclusions and recommendations of the experts, are included in the publication.

Note: Sanitary Regulations for Fish and Fish Products, OECD Document No. 51, may be purchased from OECD Regional Office, Suite 1223, 1346 Connecticut Avenue NW., Washington 6, D. C. Price is \$1.50.



Australia

AID FOR FISHERIES PROPOSED BY GOVERNMENT:

The Australian Commonwealth Government has agreed to subsidize private fishing enterprises if their prospects are reasonably bright, a conference of State Fisheries Ministers was told in Sydney.

The Government is interested in soundly-based schemes. It will not assist fly-by-night projects. One condition for Commonwealth aid is that the company must also operate outside State territorial waters.

If such schemes, however, haven't the capital to get under way, the Government is prepared to buy shares in the company and then sell them on the open market when the company is on its feet.

Several projects suggested by the various States at the Sydney conference will be considered, in priority, by the Commonwealth.

Among the projects for which aid is sought are the development of a tuna fishery in north-west Western Australian and tuna and shrimp fisheries in Queensland.

Finance for such schemes will come from the Fisheries Development Trust Fund which was established several years ago when the Commonwealth sold its whaling station at Carnarvon, Western Australia.

The conference considered a series of proposals on fisheries research, development and administration, and discussed the need for uniform regulations for the management of fisheries.

The Minister for Primary Industry told the conference that Commonwealth funds would be provided to bring an international expert to Australia to advise on fishing vessel design. The States will be asked to contribute to the cost of the visit. (Australia Fish Trades Review, October 1962.)

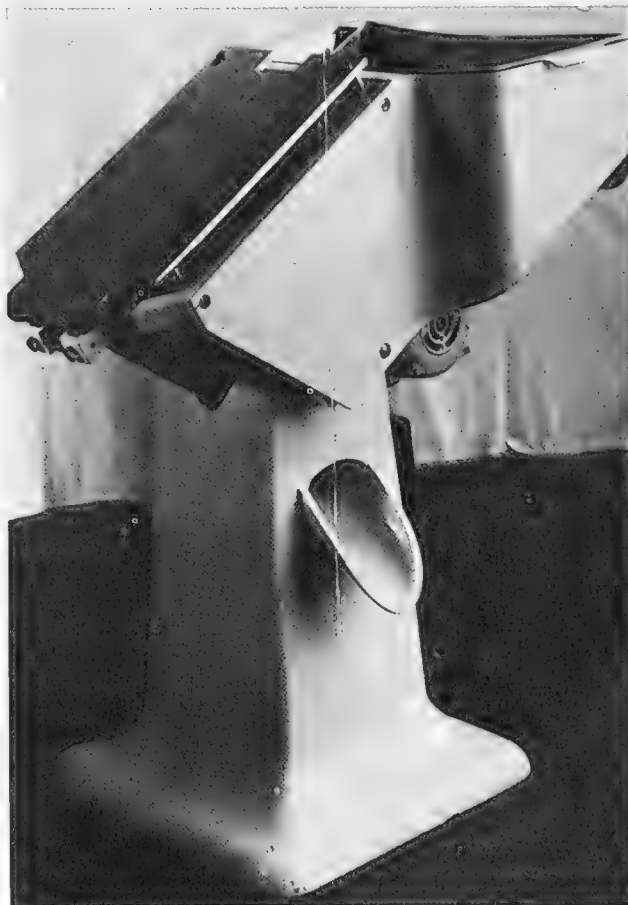


Belgium

FILLETING MACHINE DEVELOPED FOR HERRING AND PILCHARD:

A filleting machine designed primarily for herring and pilchard has been placed on

the market by a manufacturer in Antwerp, Belgium. The new machine is the result of 15 years of development and practical experience in constructing a filleting machine that is compact, economical, simple to operate, and of minimum weight. It can be easily installed, is rustproof, and is suitable for operation in any temperate or tropical climate.



Filleting machine specially built for sprat and other very small fish.

The machine is of stainless metal, with most parts made of aluminum, has an electric motor of 370 watts, 1,450 r.p.m., 220/380 volts 3-phase a.c., 50 cycles. Can also be furnished with other electrical specifications. Net weight of the machine is about 88 pounds. It needs only 10 square feet of factory space when installed. A special feature of the machine is that it produces very little noise--only a slight hum from the motor and the cutting of the fish.

The machine cuts butterfly-type fillets, and can also cut single fillets by simply turning a knob. A trained operator will be able to fillet about 3,600 herring an hour. If heads

Belgium (Contd.):

are to be removed during the filleting operation, the output is about 2,000 herring an hour. Some of the characteristics of the machine are that it automatically adjusts itself to various sizes of fish when unsorted fish are fed into it. It is capable of cutting all types of herring from hard-cured to very soft matjes, and heads and tails can be cut off if desired. Also, the machine easily cuts mutilated fish or pieces without blockage. It uses from 1 to 1½ gallons of water a minute for cleaning the fish during the filleting operation and for sluicing the waste out of the machine.

The Belgian manufacturer has also built a special filleting machine for a German firm. The machine was designed to fillet sprat counting 36-45 fish per pound. The manufacturer believes that model could be adapted to fillet other small fish such as smelt.

The machine will be exhibited at the World Fishing Exhibition to be held in London, England, May 27-31, 1963.



British Solmon Islands Protectorate

FISHERIES DEVELOPMENT, 1962:

Protectorate authorities are convinced that the waters around the Solomon Islands are filled with fish which could be commercially exploited. Until recently, organized fishing in the Solomon Islands was limited to the efforts of a small cooperative in Honiara and several individuals in the eastern Solomons. In late 1962, an Australian with business interests in the Solomon Islands surveyed the commercial fishing potential of the Solomons. He was trying to determine if live bait could be caught in sufficient quantities to justify a commercial fishing venture. The Australian's business interests in the Solomons include part ownership of a refrigeration plant in Santo.

The Protectorate Government purchased the 45-foot fishing vessel San Juanita in the first part of 1962. The vessel is being used to survey fishing grounds off the Solomons and to teach local people modern fishing methods. In May 1962, the San Juanita landed 15,885 pounds of dressed fish in Honiara.

The catch, valued at £A1,200 (US\$2,676), was partly caught by fishermen from the local cooperative for whom the vessel acted as a mothership. The Protectorate Government also plans to provide refrigeration for the local fish catch. Fish is important in the Solomon Islanders' diet. To carry out the new program, the Government has established a Fisheries Section in the Department of Agriculture. (United States Consulate, Suva, December 1, 1962.)



Canada

STUDIES AIM TO PREVENT GLUTS IN NEWFOUNDLAND'S SUMMER COD FISHERY:

The extensive spring and summer trap-net cod fishery in Newfoundland presents a singular situation which is now being investigated by the Fisheries Research Board of Canada. This phase of the Newfoundland cod fishery is unique in that the inshore fishermen have full control of the resource for a limited period.



In late spring and early summer vast schools of cod swarm to the inshore waters in pursuit of capelin. These cod come with-

Canada (Contd.):

in the three-mile limit and are thus beyond the reach of both Canadian and foreign trawlers. As the cod gorge themselves on the smelt-like capelin they are caught in trap nets and the heavy catches present a problem of temporary glut. This heavy supply in a short period creates the question of how best to handle it.

The Board's technologists agreed that one solution would be to spread the operation over a longer period. Two factors were considered: (1) the most efficient use of the labor force and (2) the preservation of the cod for processing after the heavy run of the fish comes to an end in August. There are several possible ways in which that can be done.

First of all, fish could be frozen in the round state with heads and viscera removed or partly processed in the form of rough fillets. That would mean that the fish would be filleted without the skin being removed. Later the round fish or fillets could be thawed and processing then completed. The scientists explored two types of freezing. One was the conventional plate freezing and the second brine-freezing. The latter method would permit more rapid thawing by air or water.

Another approach to the problem of keeping the fish was by live-holding. They would be kept in confinement in the traps until ready for use. That would help level off production over a longer period. Although this method has not yet been fully investigated, preliminary results have been encouraging. Scientists found that holding the live fish had no adverse effects on quality.

Methods of thawing were also explored. There are three methods; water, air, and radio-frequency thawing. Known as dielectric thawing, the last method is carried out by an apparatus which transmits radio waves into the fish. The energy is absorbed by the ice in the fish and the thawing is done more speedily than by the air or water methods.

The experiments both in freezing and controlled thawing have thrown light on many problems and the Board was told, at its annual meeting in Ottawa early in January this year, that the outlook for a satisfactory answer to some of the riddles involved in

the summer cod invasion of Newfoundland inshore waters is encouraging. (Canadian Department of Fisheries, January 7, 1963.)

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BRITISH COLUMBIA HERRING PRICE DISPUTE SETTLED:

Fishermen's representatives and herring processors in British Columbia signed agreements on November 30, 1962, ending a six-week price dispute. The agreements raised the ex-vessel price of herring used for meal and oil processing from C\$10.40 (US\$9.67) to C\$11.40 (US\$10.60) effective December 2, 1962. Under a retroactive agreement, processors will pay an adjustment of C\$0.56 (US\$0.52) a ton for reduction herring caught under the previous agreement between September 1, 1962, and October 16, 1962. It is reported that under the new agreements the individual fisherman's share of the catch will be raised to C\$1.425 (US\$1.324) per ton; also,



Off the British Columbia Coast, a Canadian purse-seiner is drawing the net tighter around a good catch of herring.

there is no change in the ex-vessel price of C\$16.00 (US\$14.88) for herring used for bait and other purposes. ("Facts on Fish," Fisheries Association of B.C., December 1962.)

The price paid British Columbia fishermen for herring to be made into fish meal and oil is not comparable with United States ex-vessel prices since plant operators in Canada own the vessels and gear and provide for most of the operating expenses.

Notes: (1) C\$1.0756 equals US\$1.

(2) Also see Commercial Fisheries Review, January 1962, p. 45.

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Canada (Contd.):

SCIENTISTS STUDY CHEMISTRY OF THE NORTH ATLANTIC LOBSTER:

Fishery scientists of Canada's Fisheries Research Board research station in Halifax, Nova Scotia, are taking a slightly different look at the highly-prized North Atlantic lobster which brings millions of dollars to Canadian Atlantic Coast fishermen each year. This time the scientists are concentrating their efforts on trying to unravel the mysteries of the creature's chemistry.

A report on the physiological approach to this shellfish with its armor-like shell was given early in January this year at the annual meeting of the Board in Ottawa.

Large holding tanks have been installed in the Halifax Technology Station capable of holding hundreds of lobsters. A long pipeline extends from the Station to the bottom of Halifax harbor to provide a continuous fresh supply of sea water to keep the lobsters alive.

There are many things the scientists hope to find. They are interested in the lobster's moulting process. Each time a lobster sheds its shell its growth and weight increase substantially. Would there be a way to increase the number of moults? That answer in itself would be a big step forward in the field of lobster research.

An important aspect of the whole program, of course, is the lobster's health. Normally, lobsters are healthy creatures. However, like all living creatures they are sometimes affected by disease. That is why the technologists want to know more about the lobster's body chemistry.

In the summer of 1962 there were casualties among lobsters stored in certain tidal holding pounds. The Board's scientists moved in to find out the cause. Samplings were made of lobsters from different districts where the casualties occurred and all indications were that the creatures had been infected with a specific bacterium while still in the sea. With the source of the trouble reasonably well identified, scientists were able to advise necessary steps to help counteract the situation. It is emphasized that this condition is not harmful to humans. (Canada's Department of Fisheries, January 7, 1963.)

* * * * *

REBIRTH OF NOVA SCOTIA WHALING INDUSTRY STIMULATES STUDY OF WHALE OILS:

The rebirth of the whaling industry in Nova Scotia, after a lapse of more than a century has given impetus to a study of whale oil in the laboratories of the Halifax Technological Station of the Fisheries Research Board of Canada. One phase of the project called for a comparative study of the qualities of oil from bottlenose and sperm whales. The two oils were shown to be essentially similar.

Details of the whaling operation and its scientific phase were given in a report submitted to the Board's annual meeting early in January 1963.

The interest in comparing bottlenose and sperm whale oils stemmed from the fact that the Nova Scotia operation is mainly concerned with the former species. The one vessel initially engaged in the project was unable, because of its small size, to hunt and boat the larger sperm whales, which measure up to 50 feet in length. Bottlenose whales were the chief prey of the catcher vessel and about 35 were harpooned last summer.

Although sperm whale oil brings a higher price than oil produced from the bottlenose whale, Halifax scientists have shown that the composition of sperm and bottlenose oils is basically the same. There are a few minor differences, but they are not regarded as of much significance by the Station's technologists. As opposed to ordinary fish oil and whale oil from the blue, fin, humpback, sei, and other whales, the sperm and bottlenose oils are largely, in a chemical sense, waxes. The wax, when extracted, is soft and white. The hard part of the wax separates itself on cooling and is used for cosmetics and medicinal preparations. The residual oil has many uses and has excellent lubricant qualities.

In addition to supplementing knowledge of whale oils generally, the findings of the Halifax scientists could mean economic benefits for the revived whaling operations.

The revival of Nova Scotia's whaling industry is a fascinating sequel to Nova Scotia's whaling history which began in the 1780's. It flourished for about a decade and then died. In the first half of the 1800's it flourished again and then declined to revive again more than a century later in 1962.

Canada (Contd.):

The Nova Scotia whaling operation is still in the experimental stage. Its sponsors hope to increase the effort this spring and are hopeful that more boats will be encouraged to join the industry. (Canada's Department of Fisheries, January 7, 1963.)



Colombia

CERTAIN TYPES OF FISHING GEAR BANNED IN COASTAL WATERS:

By a Decree effective November 9, 1962, the Colombian Ministry of Agriculture prohibits fishing with bottom-trawl nets within a nautical mile of the Colombian coast. Also fishing with gear requiring more than three men is prohibited within three nautical miles of the mouths of most Colombian rivers. Protection of the breeding grounds of certain fish was the reason given for the Decree. (United States Embassy, Bogota, December 5, 1962.)



Denmark

NEW COMMERCIAL COLD-STORAGE FACILITIES IN LIBERIA AND NIGERIA PLANNED:

A Danish firm expects to open two new commercial cold-storage warehouses on the coast of Western Africa in 1963. One will be in Monrovia, Liberia, and one will be in the Port of Apapa, Nigeria. The cold storage in Monrovia is expected to open in May 1963. The Danish firm is presently operating three cold storages in Ghana, two of which are located in Tema and the third in Accra.



France

IMPORTS OF JAPANESE FROZEN TUNA:

Japanese press reports indicated that the special import quota of 3,500 metric tons established in spring 1962 by the French Government to permit the importation in 1962 of Japanese frozen tuna was expected to be filled. As of early December, Japanese exports of frozen tuna to France were said to

total 3,300 metric tons and negotiations were being conducted for the delivery of 200 metric tons to fill the French import quota.

Reportedly, yellowfin tuna originally were the main species exported to France. However, following problems concerning their quality, emphasis was placed on exporting albacore. The albacore tuna were reported to have brought a high of \$450 a metric ton (c.i.f. France) and as of early December were said to be selling for \$420 per metric ton. (Suisan Tsushin, December 5, 1962.)

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SHIPYARDS GET KOREAN ORDER FOR 160 FISHING VESSELS:

Shipyards in Dieppe, France, are reported to have received an order for the construction of 160 fishing vessels for the Government of South Korea, and the report goes on to say that the Dieppe yards could expect more orders in the near future.

The French order is obviously a result of a recent loan of US\$120 million by an Italian-French combine for the development of Korea's fishing industry. The agreement embodying this loan is said to call for the construction of over 700 new fishing vessels with an average gross tonnage of 160. Most of them will be built in Europe, but a few are expected to be constructed in South Korea. The motors and equipment for those built in Korea will be shipped from Europe.

When this program is completed it is expected that the South Korean fleet will be about double its present strength.

The Italian-French combine is to train Korean fishermen and technicians and assist in marketing Korean fish and fishery products throughout the world.

This project is expected to boost the annual Korean catch to over 1,000,000 metric tons. (The Korean catch in 1961 amounted to 412,000 tons.) Modern facilities are to be created at six Korean ports for the proper handling and storage of the increased catch. (The Fishing News, London, December 14, 1962.)

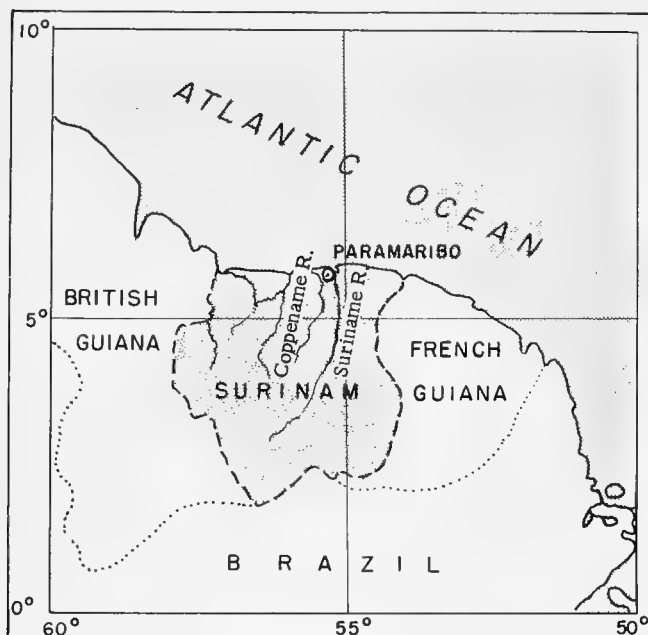
Note: See Commercial Fisheries Review, December 1962 p. 77, October 1962 p. 62, August 1962 p. 79.



French Guiana

TWO UNITED STATES FIRMS TO DEVELOP SHRIMP FISHERY OF FRENCH GUIANA:

A fishery firm of Tampa, Fla., has started building a shrimp packing plant at St. Laurent, French Guiana. In November 1962, seven shrimp vessels were on the way to French Guiana to fish the shrimp grounds 60 miles off the coast of French Guiana. Fifty shrimp vessels will be operating off French Guiana within a year, according to the Florida firm's manager at St. Laurent. It is expected that most of the vessels will be from the United States and that the families of the vessels' captains will go to St. Laurent.



The new shrimp-packing plant at St. Laurent will be located at the mouth of the Maroni River. It will be housed in buildings which were formerly part of the St. Laurent Penal Colony. Two large freezers and an ice-making machine are already installed. According to the manager, investment in the plant is now US\$225,000 in imported equipment and local construction materials. A shrimp-grading machine will be imported in the near future, and a dock for loading will be built. Shrimp will be graded, packed, and frozen at St. Laurent and shipped to the United States once a month by merchant ship. The new shrimp operation was expected to create jobs for 100 residents of French Guiana before the end of 1962.

Another United States firm is interested in building a shrimp-packing plant near

Cayenne, French Guiana. The firm has succeeded in getting \$80,000 worth of credits from the French Government for the installation of water lines to their plant site outside Cayenne. (United States Consulate, Martinique, November 30, 1962.)



French Polynesia

IMPROVEMENT OF FISHERIES PLANNED:

Surrounded by a sea abounding in fish and shellfish, French Polynesians have always devoted much of their time to fishing as a principal source of food. However, fishing methods are primitive and fishing is limited to the lagoons, streams, and reefs. Almost all the catch is consumed locally or marketed in the urban centers such as Papeete. It is estimated that 1,000 tons of locally-caught fish are sold annually in the markets of Papeete. However, the local catch has never been sufficient to meet growing demands and the territory imports a considerable quantity of canned fish.

The short supply of local fish is due to the lack of refrigerated shipping or storage in the Islands, and the scarcity of fish close to the major population centers (particularly in the lagoons around Tahiti) depleted. To counter those difficulties, a number of measures have been taken in the past two years. Most of the Territory's fishermen have formed cooperatives to pool financial resources for the purchase of larger vessels, and more modern fishing gear. Also, cooperatives have negotiated a number of loans with Government lending agencies. The Government, in turn, has installed refrigeration equipment in several urban centers for fish storage and introduced ice plants in several islands near the main fishing grounds so that the cooperatives can ice-down their catches for shipment to Papeete and elsewhere.

However, the movement of fish to market remains difficult and the urban centers are still largely dependent on imported canned or frozen fish. The Government hopes during its present five-year development plan to introduce sufficient ice houses, small refrigeration plants, and "ice-boats" to the Territory to eventually make possible self-sufficiency with respect to fish.

The French Government at Papeete has long been interested in introducing offshore

French Polynesia (Contd.):

commercial fishing, fish canneries, and fish byproduct plants. Those would provide increased employment, exports, and would help to expand the narrow base of the Territory's economy. The French Government feels that the sea is one of the Territory's richest but most neglected natural resources. Early in 1962 the Government at Papeete approved a proposal by a United States tuna-canning company to invest CFP70 million (US\$795,000) in a fish cold-storage plant near Papeete. At the outset it is planned that 16 Japanese long-line fishing vessels of about 76 tons will supply the plant with tuna. Later, if justified, the fleet would be increased to 40 or 50 vessels and a tuna cannery would be built. It is expected that the frozen fish will be marketed locally, as well as in Japan, the United States, and France. Native fishermen would be protected by prohibiting fishing close inshore and in other traditional native fishing grounds. It is anticipated that this United States firm will begin operations this year.

French Polynesia is a source of the relatively rare "black pearl" type oyster shell. Other sources are the Cook and Fiji Islands. For many years the collection and export of mother-of-pearl shell was uncontrolled and caused serious depletion of the resource. Harvesting and export are now rigidly controlled, but the harvest still fluctuates widely due to fluctuations in world demand and price, but also due to the availability of the best pearl shell.

Shell prices have fluctuated wildly in recent years, and are dependent on economic conditions in the United States and Europe--the Territory's principal markets. However, prices have risen over recent years from a low of CFP45 per kilo (about 23 U. S. cents a pound) in 1951 to a 1962 high of about CFP200 per kilo (about US\$1.03 a pound) f.o.b. Papeete. Except for 1958 when the price dropped to a low CFP75 per kilo (about 85 U. S. cents a pound), the value of pearl shell has risen but production has varied considerably and dropped somewhat in the past two years. The Government during 1961-65 plans to spend about CFP7.5 million (about US\$85,000) on rehabilitating the pearl shell beds and on the development of pearl-shell oyster culture. The Government hopes to increase annual exports of pearl shell by at least CFP20 million (about US\$220,000) annually by 1975. With respect to pearl-shell oyster culture, seeding is now being carried out on an ex-

perimental basis in several areas by a Japanese company.

The United States was at one time a primary customer of the Territory's pearl shell exports, but is now second to West Germany due to the introduction in the United States of plastic buttons. (United States Consul in Suva, January 3, 1963.)



German Federal Republic

FISHERIES RESEARCH LABORATORIES:

Because of the accessible fishing grounds off West Germany's Baltic and North Sea coasts plus those in international waters within the range of the deep-water vessels, West Germany has long recognized the value of both applied and basic fisheries research. Fisheries research activities are headed by the Federal Research Station for Fisheries (Bundesforschungsanstalt für Fischerei) located in Hamburg. This station has five branches and several substations.

German commercial fishermen in 1959 landed 770,000 metric tons of fish and in 1960, 593,000 tons. Only Norway, Great Britain, and Spain surpass Germany as fishing nations in Europe. The fishing industry contributes approximately DM 3.8 billion (US\$950 million) each year to the gross national product.

The oldest fisheries research laboratory is the Biologische Anstalt (Biological Station) at Helgoland which was established by Prussia in 1892. Anton Dohrn, the eminent marine biologist, whose descendants still operate the Marine Biological Laboratory in Naples, was the moving spirit in this enterprise, together with Friedrich Heincke. It was absorbed into the Reichsanstalt für Fischerei (National Fishery Institute) which was founded in 1938 in Berlin. With the downfall of the Third Reich and the formation of the German Federal Republic, the Institute was given its present name and Federal affiliation in 1950.

The Biological Station at Helgoland is primarily concerned with basic research in the field of general marine biology. There are laboratories for zoology, animal physiology, botany, microbiology, fish biology, and plankton studies. In the tradition of marine biological laboratories elsewhere (Naples, Italy, Woods Hole, Mass. etc.), facilities are available for guest investigators, who fre-

German Federal Republic (Contd.):

quently spend summers or longer periods on some specific aspects of marine biology.

In addition to the Biological Station at Helgoland, there are four other branch laboratories located in Hamburg. These are: (1) Institute for Deep Sea Fishing; (2) Institute for Coastal and Inland Fishing; (3) Institute for Netting and Materials Research; and (4) Institute for Fish Processing. The types of activities at each of those institutes are indicated from their names. Virtually all problems of deep-sea and inland fishing are studied, especially the biology of edible fishes plus the seasonal changes of fish availability, development of new means for capture, etc. The Institute for Deep Sea Fishing also maintains a branch laboratory in Bremerhaven, and stations for shoals research in List and Sylt.

Fisheries research is conducted by a staff of 157 (including 124 administrative and technical employees). The budget for 1962 was DM3.0 million (US\$750,000), a slight apparent decrease from the DM3.4 million (US\$850,000) in 1961. Actually, the allotment for fisheries research was substantially increased over 1961. Over a million DM (\$250,000) of the 1961 budget was allocated to completion and purchase of equipment for a new service building. (United States Embassy, Bonn, August 15, 1962.)



Ghana

FISHERIES BILL STIRS DEBATE ON FOREIGN-OWNED TUNA BASE:

The Fisheries (Amendment) Bill, 1962, was debated in the Ghanaian National Assembly on December 4, 1962. The Bill provides that the shares of a company or group of persons engaged in the fishing industry in Ghana must be wholly owned by Ghanaian nationals resident in Ghana, with the exception of a foreign-owned company under contract with the Ghana Government for the purpose of exporting fish to another country.

The international subsidiary of one of the large United States tuna packers signed an agreement with the Government of Ghana in October 1960. The agreement gives the firm the right to process and export tuna in Ghana for a period of 35 years. The firm agreed to

train Ghanaians in tuna fishing and to provide other unspecified technical assistance and advice. The firm also obtained an option to build a tuna cannery at Tema within two years if feasible and in the company's interest. The option for the cannery lapsed on October 16, 1962.

The rights of the company under its agreement with Ghana would be protected by the exception in the new Fisheries (Amendment) Bill. During debate on the Bill, a member of the opposition party in Ghana stated, "I do not think it is proper at this time in Ghana when we need fish so badly to allow a foreign firm to export our fish overseas."

In reply, the Ghanaian Minister of Agriculture pointed out that deep-sea tuna fishing is not exploitation of territorial waters. The Minister stated, "The present arrangement (with the United States firm) is more of transshipment than exploitation of our territorial waters. The presence of these vessels in Ghana is beneficial because not only do these vessels use our port facilities, but also the tuna fish which has a limited market here is exported through them. In fact the tuna is more for export than for local consumption. Our own Fishing Corporation has two tuna fishing vessels which are going to be used for tuna fishing for export in order to earn foreign exchange, mostly scarce dollars. The main object of the agreement was in cooperation with our own Fishing Corporation to develop tuna fishing industry."

The Minister of Agriculture also pointed out that agreements must be honored. He explained that the agreement with the United States firm has been referred to the Ghanaian Minister of Justice for review because certain conditions in the agreement had not been honored. (United States Embassy, Accra, December 11, 1962.)



Guatemala

SHRIMP EXPORTS INCREASED SHARPLY IN 1962:

In its annual report on the fishing industry, the Department of Hunting and Fishing of the Ministry of Agriculture reported that Guatemala exported close to 1.9 million pounds of shrimp with a gross value of about US\$1.8 million during the year ending November 30, 1962. The Department estimated

Guatemala (Contd.):

that the net value (less commissions, freight, insurance, and other costs) entering Guatemala as foreign exchange was close to \$1.6 million. In addition to the shrimp, about 279,000 pounds of other fishery products were landed for local consumption.

During calendar year 1961, Guatemala exported shrimp valued at about \$210,000, or only about 11 percent of the value of the shrimp exports made between December 1, 1961, and November 30, 1962. Landings by ports for the year ending November 30, 1962, were: Puerto San Jose, 803,940 pounds of shrimp and 154,709 pounds of fish; Puerto Champerico, 936,600 pounds of shrimp and 115,000 pounds of fish; and Puerto Barrios, 118,931 pounds of shrimp and 9,703 pounds of fish. (United States Embassy, Guatemala City, January 3, 1963.)



Honduras

UNITED STATES FIRM ENTERS SHRIMP AND SPINY LOBSTER FISHERIES:

A United States firm began operating a 140-foot transport vessel in the shrimp and spiny lobster fisheries off the North Coast of Honduras during the latter part of 1962.



The vessel, which is equipped with freezing and ice-making equipment, loads the shrimp and spiny lobster catch of about 40 small boats in the vicinity of Caratasca and transports it to Tela, Honduras. The shrimp and spiny lobster are flown from Tela to Miami, Fla., by a "C-46." The firm expected to make one airborne shipment per week to Miami with about 12,000 pounds of spiny lobsters and shrimp. (United States Embassy, Tegucigalpa, November 29, 1962.)



Iceland

HERRING FISHING CONTRACT DISPUTE SETTLED:

The Icelandic motorboat owners and the seamen approved an agreement which their representatives reached on the South Coast herring share-of-the-catch dispute. The settlement gives the seamen about $\frac{1}{2}$ percent more of the value of the herring catch than the separate Akranes agreement. The earlier agreement in Akranes gave the seamen more than was proposed by Icelandic Government mediators. (United States Embassy, Reykjavik, November 23, 1962.)



Iran

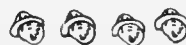
NEW COMPANY TO BE FORMED TO OPERATE IN PERSIAN GULF:

The formation of an Iranian corporation to exploit fisheries in the Persian Gulf has been approved by the Government-owned National Iranian Fisheries Company (Shilat-



Iran). The new company will be capitalized at 100 million rials (US\$1.33 million) divided into 10,000 shares. Plans call for the capital to be raised through public subscription, with unsold shares to be purchased by the Government. (United States Embassy, Tehran, November 15, 1962.)

Notes: (1) Values converted at rate of 75.0 rials equal US\$1.
(2) See *Commercial Fisheries Review*, September 1962 p. 80.



Italy

FROZEN TUNA IMPORT QUOTA:

The Italian Government, which set a duty-free import quota of 25,000 metric tons of frozen tuna for 1962, was reported to have decided to allow an additional 7,000 metric tons of frozen tuna to enter duty free into Italy in 1962 in response to a strong appeal made by the Italian National Association of the Fish Canning Industry (Assoconserve). It is said that Italy submitted a request to this effect to the EEC (Common Market) Secretariat. However, the 1963 Italian duty-free import quota is to remain at 25,000 metric tons, but due consideration is expected to be given to possible increases for that year, pending future developments.

Japanese exports of frozen tuna to Italy for the period January-November 1962 are said to exceed 30,000 metric tons. For that portion exceeding 25,000 metric tons, the Italian tuna industry is said to have submitted a guarantee to pay the 7.5 percent ad valorem import duty due on it, pending a decision by the EEC Secretariat on the Italian Government's request for an additional 7,000-ton duty-free import quota. (Suisan Tsushin, December 10, 1962.)



Ivory Coast

FISHING INDUSTRY EXPANDS:

The numerous activities of the Ivory Coast Fisheries Service, which was created in 1956, have helped develop the fishing industry. The Fisheries Service has trained 40 seamen and 7 master fishermen at its Training Center for local fishermen. The Training Center was opened in 1960.

Ivory Coast: Size of Fishing Fleet and Fishery Landings, 1955-1960

Year	Fishing Vessels	Fishery Landings
	Number of Vessels	Metric Tons
1960	53	29,000
1959	48	25,000
1958	34	25,000
1957	23	15,000
1956	20	9,000
1955	14	5,000

A sardine-tuna fishing vessel is being added to the Ivory Coast fishing fleet with the help of funds from the United States Agency for International Development. Sardine fishing is now the the most important activity of the Ivory Coast fishing fleet, but



tuna fishing is developing rapidly with the construction of refrigeration and canning plants. Several foreign firms have established tuna fishing bases in the Ivory Coast. (United States Embassy, Abidjan, September 26, 1962.)

Note: See Commercial Fisheries Review, August 1962 p. 66, May 1962 p. 52, December 1961 p. 72.

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NEW FISHING PORT OFFERS INVESTMENT OPPORTUNITY:

As an integral part of a US\$4.8 million project for the construction of a new fishing port, the Ivory Coast Government is planning the construction of a cold-storage plant. It seeks to attract private business investment to finance part of the approximately \$3.0 million required for its construction. Several United States fish canners have shown an interest in this project. Investors interested in either the opportunity for participation in the cold-storage plant or the general potential of the fishing industry in Ivory Coast should contact John C. Elliott, Trade Advisor, Ivory Coast Resources Agency, 1270 Avenue of the Americas, New York, N. Y.

The project for construction of a modern fish port is under way: the first phase (involving the construction of a main pier 400 meters or 1,312 feet long, with necessary handling equipment, sorting and auction rooms, and installations for wholesalers) was scheduled to be completed before the end of 1962. The second phase, which will begin after completion of the main pier, will involve construction of the following facilities: (1) an outfitting wharf capable of holding heavy duty lifting and handling machinery;

Ivory Coast (Contd.):

(2) a light duty wharf where vessels can berth for supplies, provisions, fresh water, and carry out light repair and maintenance work; (3) a special dock for tuna fishing vessels; and (4) a network of roads and railroads to the various wharves and the cold-storage plant, which is to be located near the main landing pier.

Since 1957, landings of fishery products have increased from about 22,600 metric tons to 37,000 tons in 1960. The Ivory Coast fishing industry has outgrown its present fishing port facilities. The modern port and cold-storage plant will enable the industry to expand and able to handle landings, an estimated 63,000 tons by 1975.

The planned cold-storage plant will permit a more rational and regular distribution of fish, and will be a stimulus to the tuna fishing industry. (United States Embassy in Abidjan, December 14, 1962.)



Japan

ALBACORE TUNA PRICES IN FALL 1962 REMAINED FIRM:

The late July 1962 decline in frozen tuna prices in the United States resulted in a situation where Japanese-caught tuna were being almost wholly exported to Europe, where demand and prices were good, the Japanese periodical Suisan Tsushin, of December 15, 1962, stated. Frozen albacore tuna for the United States market were said to be selling for \$355 a short ton c.&f. in mid-December 1962, whereas they sold in Europe around \$420 a metric ton c.&f. The difference in shipping costs between the two markets can be reduced by utilizing tramp steamers for shipments to Europe, states the periodical.

For awhile, following the decline in United States ex-vessel tuna prices, it was thought that ex-vessel albacore prices in Japan would fall below 110 yen per kilogram (US\$277 a short ton). However, the brisk demand in Europe for albacore tuna is said to have stabilized the ex-vessel price for that species, which as of mid-December 1962 was reported to be selling for about 125 yen per kilogram (\$315 a short ton). Reportedly, at that price, the Japanese can-

ned tuna packers can still readily compete for the raw product.

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FIRST WINTER ALBACORE LANDING:

The first landing of Japanese winter albacore was reported at the Japanese tuna port of Yaizu on December 24, 1962. A total of 40 metric tons were landed. The fish, ranging in size from 11-22 pounds, were taken over a two-day period (December 19-20) about 120 miles off Choshi, Chiba Prefecture. Reportedly, winter albacore are usually taken farther north off Kinkazan, Miyagi Prefecture, and their appearance farther south this year is considered somewhat unusual.

The medium and large albacore sold ex-vessel for 125-150 yen per kilogram (US\$315-378 a short ton) and the small albacore 106-110 yen per kilogram (\$267-277). About half of the 40 tons were sold to canners. (Suisan Keizai Shimbun, December 27, 1962.)

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TUNA EX-VESSEL PRICES AT TOKYO:

The following ex-vessel prices were paid on December 10, 1962, for 390 metric tons of frozen tuna and other fish landed at the Tokyo

Product	Price	
	Yen/Kg.	US\$/Short Ton
Yellowfin (gilled & gutted):		
Extra lge., (over 120 lbs.)	110	277
Large (100-120 lbs.)	120-123	302-310
Medium (80-100 lbs.)	123	310
Small (20-80 lbs.)	120-123	302-310
Albacore	128	323
Filletts:		
Yellowfin	134.5-138	339-348
Big-eyed	138-141.3	348-356

Central Fish Market by two Japanese long-liners.

The following ex-vessel prices were paid on December 25, 1962, for 240 metric tons of frozen tuna and other fish landed at the

Product	Price	
	Yen/Kg.	US\$/Short Ton
Yellowfin (gilled & gutted):		
Extra lge., (over 120 lbs.)	100	252
Large (100-120 lbs.)	106	267
Medium (80-100 lbs.)	106	267
Small (20-80 lbs.)	105	264
Albacore	128.6-131.5	324-332
Filletts:		
Yellowfin	118	297
Big-eyed	121	305

Japan (Contd.):

Tokyo Central Fish Market. (Suisan Keizai Shimbun, December 12 & 28, 1962, respectively.)

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FROZEN TUNA MARKET FORECAST FOR EUROPE, 1963:

Japanese exports of frozen tuna to Europe for January-November 1962 totaled 43,195 metric tons, according to the Japanese periodical Suisan Tsushin, dated December 17. At that pace, 1962 Japanese frozen tuna exports to Europe were expected to total around 50,000 metric tons. This would represent an increase of 10,000 tons over 1961, when exports totaled 39,997 tons.

In 1963, Japanese frozen tuna exports to Europe are expected to increase further, possibly to 70,000 metric tons. This forecast is based on an anticipated increased demand for tuna in those European nations presently importing Japanese tuna, the opening of a new market in Spain following the removal of restrictions on Japanese exports of frozen tuna to that country, and on the likelihood that new markets may possibly develop in other countries, such as Belgium and the Netherlands.

The Japanese forecast of the 1963 European tuna market trends:

Italy: Japanese exports in 1960 totaled 22,000 tons; in 1961, 26,000 tons; and in 1962 will exceed 33,000 tons. Production facilities in Italy being expanded. Italian consumption of tuna increasing; market conditions relatively stable. Japanese 1963 exports of 37,000-40,000 metric tons fully within realm of possibility.

Yugoslavia: Japanese exports in 1961 totaled 9,400 tons. Declined somewhat in 1962 but expected to total around 8,000 tons. Canned tuna produced by Yugoslavia being exported to such countries as West Germany, where great market potential exists. Yugoslavia temporarily stopped purchasing frozen tuna from Japan but has again commenced buying, paying good prices. Exports in 1963 should range between 10,000-15,000 metric tons.

Czechoslovakia: Japanese exports in 1961 totaled 1,700 tons; in 1962 expected to total around 1,000 tons. Exports in 1963 expected to total from 1,000-1,500 tons, with emphasis on the exportation of lower-priced tuna, like big-eyed, which in December 1962 sold for \$345 c.&f. Hamburg. Czechoslovakia said to be packing about half of tuna in cans and smoking remainder, but its canned tuna production expected to increase gradually.

France: The French Government, for the first time, issued an import license in 1962 authorizing importation of 3,500 tons of tuna, and expected to increase this amount in 1963 to 6,000 tons. Reportedly, the 1963 import license will be issued after May 1963 but may possibly be issued earlier. In terms of price, France is best market for Japanese frozen tuna. In this respect, great hopes held for France as market for Japanese-caught albacore.

Spain: Japanese exports to Las Palmas, Canary Islands, limited to 2,000 tons a year. Japanese exports to Spain proper limited to those originating from Japan proper, but no restrictions on amount. However, export regulations expected to be revised in 1963. Should transshipments to Spain proper be approved, exports to that country, including those to Las Palmas, expected to total 5,000 tons a year.

Tunisia, Libya, Ghana: Japanese exports to those African countries, which totaled 1,200 metric tons in 1961, increased to 1,700 tons in 1962, and expected to reach 2,000 tons in 1963.

In discussing 1963 frozen tuna trends, Suisan Tsushin further states that the four United States canneries located in Puerto Rico will be in full operation next year, and that for those four canneries and for the one United States tuna packing company located in Maryland, a total in the neighborhood of 100,000 short tons of raw tuna will be required. Reportedly, those five canneries will rely on United States and European fishing vessels to furnish as much of their raw tuna requirements as possible, but would have to depend on Japanese vessels to supply the greater portion of their needs.

Present production of tuna in the Atlantic Ocean is estimated at 80,000 metric tons by the periodical, which states that the Atlantic tuna production cannot possibly meet 1963 demand for tuna in the United States and in Europe, and adds that the shortage of raw tuna supply in 1963 will inevitably be greatly accelerated, if the decline in the Atlantic tuna catch should continue.

* * * * *

RESTRICTIONS ON INDIAN OCEAN TUNA TRANSSHIPMENT PORTS REMOVED:

The Japanese Fisheries Agency, which, heretofore, had restricted transshipments of Indian Ocean-caught tuna to the ports of Penang (Malaya) and Singapore, has liberalized its transshipment policy. Henceforth, catches made in the Indian Ocean can be landed or transshipped from any port bordering the Indian Ocean. (Suisan Keizai Shimbun, December 25, 1962.)

* * * * *

NEW TUNA VESSEL CONSTRUCTION:

At a press interview on December 25, 1962, the Japanese Fisheries Agency announced that it would permit the Japanese salmon fishermen engaged in the Japan Sea pink salmon fishery to construct a total of twelve 99-ton tuna vessels, but 15 salmon vessels must be retired from the salmon fishery for every 99-ton tuna vessel built. In addition, the Fisheries Agency, on December 27, reportedly was contemplating permitting the pink salmon fishermen to construct seven 85-ton trawlers, with ten salmon vessels to be retired for every trawler built, which would then mean that the present Japan Sea pink salmon fleet of 540 vessels would be reduced by 250 vessels to 290 vessels.

Also, at the December 25 press conference, the Fisheries Agency announced that it would permit eight 99-ton tuna vessels to be constructed under its policy of promoting the coastal fishery, and eleven 99-ton vessels to be constructed for assignment to the proposed Fiji Islands tuna base. The net effect of the Agency's action is that the new tuna vessel construction of 20,000 gross tons, which it authorized in August 1962, will be increased

Japan (Contd.):

by an additional 900 gross tons, or by the equivalent of nine 99-ton tuna vessels. (Suisan Keizai Shimbun, December 26 & 28, 1962.)

Editor's Note: Japanese tuna vessels between 40-99 gross tons are classified as medium-class tuna vessels. Those over 100 tons are classified as distant-water vessels. Both of those classes of vessels require fishing licenses, whereas tuna vessels under 39 gross tons do not. A press report January 1, 1963, indicated that in 1961, of a total of 1,300 tuna vessels over 40 tons gross, 409 vessels were in the 40-99 ton class. As for tuna vessels under 39 tons gross, a 1960 Government survey revealed that there were over 2,300 vessels in that category.

TUNA LANDINGS BY MOTHERSHIP FROM SOUTH PACIFIC AREA, 1950-1960:

Landings by the Japanese mothership fleets fishing for tuna in the South Pacific increased from 6,479 metric tons (about 14.3 million pounds) in 1950 (when two mother-

most Japanese tuna vessels (which are equipped with air-blast freezers) this vessel will be equipped with a 250-ton capacity brine tank. The vessel, the Akashi Maru, is scheduled to be completed in late February 1963. The vessel will be sent to the Atlantic Ocean in April. (Suisan Tsushin, December 19, 1962.)

BOTTOMFISH FACTORYSHIP OPERATIONS IN BERING SEA, 1962:

In the 1962 season, Japan had 5 meal and 4 freezer factoryships in Bering Sea. Both were said to be unprofitable, and the meal vessels may not return to the Bering Sea for the summer of 1963.

Those for meal were mostly Antarctic whale ships of 8,000-14,000 gross tons, with a capacity of 500 metric tons of raw fish daily for reduction into meal and oil. The freezer capacity was 200 tons daily and the cold-storage capacity about 2,000-3,500 tons. Meal was transferred to supply vessels once or twice during the season, but frozen products were transferred every 10 or 15 days.

The five meal vessels were served by 10 or 12 pairs of trawlers and 4 or 5 single trawlers called "Hokkaido" boats. The pair trawlers were 100-150 gross tons with about 350 hp. engines. The Hokkaido trawlers were smaller, 60-80 tons, and underpowered with about 250-hp. engines. They took smaller catches.

The meal vessels received mostly flounders. Small flounders were frozen whole, larger sizes were dressed by

Japanese South Pacific Mothership Tuna Fishery Landings, 1950-1960

Species	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950
.....(Metric Tons).....											
Tuna:											
Skipjack	60	78	42	42	15	28	15	11	28	18	11
Bluefin	595	6,596	4	5	5	6	618	7	7	2	2
Albacore	7,971	5,555	4,096	3,126	3,690	4,906	3,555	291	72	124	44
Big-eyed	1,710	1,364	1,911	1,854	1,496	768	1,199	748	539	2,433	523
Yellowfin	8,588	2,920	4,657	5,154	2,021	2,921	3,886	4,347	4,017	4,926	3,726
Swordfish & related species:											
Striped marlin	761	755	806	394	1,049	1,117	1,064	4	15	4	1
Broadbill	247	281	199	112	210	168	115	19	23	23	11
Black marlin	1,333	699	879	1,510	816	1,318	1,498	1,272	654	2,302	1,488
White marlin	202	114	115	147	122	263	542	145	236	43	25
Sailfish	1,839	193	209	246	147	232	134	174	78	59	20
Sharks	314	1,813	1,226	1,375	1,307	1,538	1,347	1,095	1,000	1,154	605
Other	382	320	241	142	302	297	148	19	43	76	22
Total	24,002	20,688	14,385	14,107	11,180	13,562	14,121	8,132	6,712	11,164	6,479

ships were first licensed to fish that area) to 24,002 tons (about 53 million pounds) in 1960. The landings have varied due to the number of mothership fleets and catcher vessels, the availability of the various species of tuna and knowledge of tuna fishing grounds.

TUNA VESSEL TO BE EQUIPPED WITH BRINE TANK:

A Japanese fishing company is having a 300-ton tuna fishing vessel constructed in Shimizu, Skizuoka Prefecture, but unlike

removing heads and viscera before freezing. Plate freezers were used and frozen flounders were packed in 12-13-kilo (26.5-28.5 pounds) blocks. Since pair trawlers caught the most fish, the single trawlers did research for new grounds.

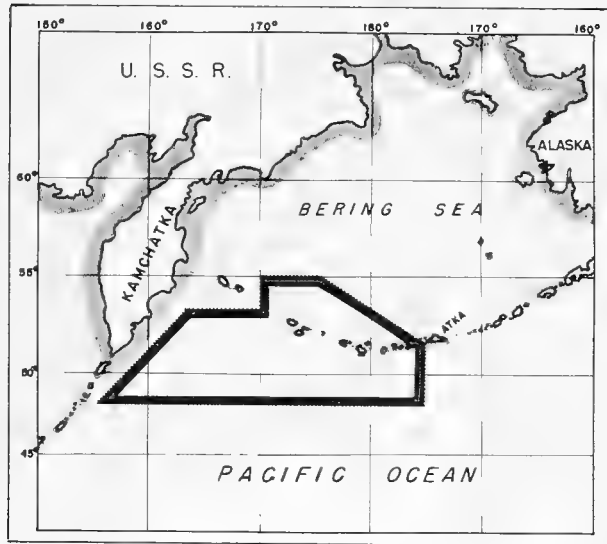
Formerly, 75 flounders of the smallest size filled a 13 kilo (28.5-pound) package. In the 1962 season it took 100-120, since the fish are getting smaller and thinner. Of four sizes of flounders, now only 10 percent of the catch was the largest size, while 30 percent was the smallest size. There were four kinds of flounders--yellow, golden, white, and asappa. Yellow flounders are cheapest and asappa are most expensive, but the latter made up only 2-3 percent of the catch. The white flounder grounds were found for the first time this year. Some "black halibut" or "oil flounder"--as designated by the Japanese--are caught and used for meal only.

Pair trawlers trawled out from the factoryship about two hours, after which one vessel took alongside the cod end. Then a new trawl was set and the vessels trawled back to the

Japan (Contd.):

ocean perch and poorest on flounders. Single trawlers had the opposite experience.

The production of one freezer ship was about 5,000 tons--divided as follows: 3,000 tons of flounders, 1,000 tons of shrimp, 500 tons of dressed fish, 300 tons of fillets of ocean perch, and 200 tons of miscellaneous fish.



The quota of the meal factoryships was about 100 tons of meal per day each. Their production was about 80 tons per day each. The four freezer ships (4,000-8,000 gross tons) were mostly Antarctic whale freezer ships being used in the Bering Sea in the off-season. They could freeze 200 tons daily and had a cold-storage capacity of 4,500 tons. They transferred some frozen products to supply vessels during the 100-130 day season. The primary frozen products were shrimp and ocean perch. However, the cargo was completed with flounders, if necessary. The freezer ships had 12 pairs of trawlers, which took 40-50 tons of shrimp or about the same amount of ocean perch daily. Some Alaskan pollock were taken with the ocean perch, but were discarded. The ocean perch season is early--in May and June on grounds north of Unimak Pass. Shrimp are caught in June and until July 15, northwest of the Pribilof Islands. In other areas they are caught all year round. The best quality shrimp are caught from May to August. After August they are spawning. Flounders were taken more toward Bristol Bay.

Most shrimp was frozen round, but some was beheaded by hand. Two or three freezer ships had United States machinery for mechanically peeling shrimp. Ocean perch mostly were frozen dressed--heads off and gutted, using a German beheading machine. Two factoryships had German filleting machines. Single fillets were frozen skins on for export to the United States. In Japan the two single fillets were wrapped in cellophane for export to the United States. Fillets under 3½ ounces were retained in Japan. The average size of the fillets for the United States was about 4½ ounces each. The average 1.54-pound fish had a 38-percent yield and gave two fillets of about 4.7 ounces each.

The cod catch was small and kept mostly for the Japanese market. The head was removed and the fish slit down the back for a butterfly cod fillet. Some cod were machine filleted and frozen for the United States market, but quality and worms gave trouble.

Alaska pollock were used only for meal. They were discarded if taken on freezer vessels. Some long-liners with special licenses took halibut and sablefish west of Abstinence Line and froze their catches. Some ocean perch had parasites and some cod had worms. Both were giving trouble in exports to the United States. Pair trawlers did best on shrimp and

factoryship and hauled in the second cod end. The factoryship took the two cod ends aboard by crane. The round trip took about five hours. The catch of flounders varied from 2-25 metric tons. Single trawlers usually delivered once at night--possibly 5 to 10 tons. If fishing was good, they delivered twice daily.

* * * * *

GOVERNMENT TO FINANCE SHRIMP BASE IN NORTH BORNEO:

The Japanese Overseas Economic Cooperative Fund (established by the Japanese Government in February 1960 with a capital of 5.2 billion yen--US\$14.4 million--to promote development of Japanese enterprises in Southeast Asia) is reported to have decided to loan 30 million yen (\$83,333) to a North Borneo fishery company. According to press reports, the company is a cooperative shrimp enterprise to be established in Sandakan, North Borneo, with Japan contributing 48 percent to the total capital of 70 million yen (\$194,000) and North Borneo 52 percent. Two Japanese firms are participating in the venture.

The North Borneo company is expected to commence operations by April 1963. (*Suisan Keizai Shimbun*, December 28, 1962.)

* * * * *

TESTS WITH POWER BLOCK ENCOURAGING:

From August-October 1962, a Japanese fishing company conducted experiments testing the efficiency of a United States-made power block in purse-seine fishing operations off northern Japan.

The *Kenyo Maru* (242 gross tons) operating from its base at Shiogama Harbor, was used in the test operations. The vessel was originally built for purse seining, but remodeled later for tuna long-line fishing and operated in that fishery for several years. In 1962 it was reconverted for purse-seine fishing at a cost of about 23.0 million yen (about US\$64,000). The vessel was equipped with a power block, a topping winch, a vanging winch, a double hydraulic pump, and a remote control panel. The power block was fitted to a five-ton rolling boom nine meters (29.5 feet) high. All equipment was purchased from a United States company.

The vessel fished for 65 days on the Pacific Ocean side of Honshu Island during the three-month test period and made 38 seine sets which yielded a catch of 143.1 metric tons of fish, valued at about 9.9 million yen (US\$27,500).

Japan (Contd.):

In conventional-type fishing, the Kenyo Maru would ordinarily carry 28 or more crew members to handle all equipment and fishing gear. By installation of the power block it was found that about 20 men could perform the same task. The number of men handling the net was reduced from 12 to 7, with two men each on the cork and lead lines, and three men handling the web. Compared with conventional methods of lifting the seine, the time was reduced one hour by use of the power block. There was no slippage of the net in the block during lifting operations which is a common occurrence with conventional equipment.

On several occasions the webbing parted during lifting operations. The Japanese fishing company states that studies are required to determine whether this was caused by:

(1) lack of teamwork in handling the cork and the lead lines; (2) unevenness of lifting the net by the power block or; (3) whether the breaks were caused by loss in tensile strength of the webbing after water shrinkage.

Discounting those problems and the small catch, it is reported that the firm considers the trial test of the power block most satisfactory. (Fisheries Attache, United States Embassy, Tokyo, November 12, 1962.)

Note: See Commercial Fisheries Review, November 1962 p. 74.



Jordan

INCREASE IN LANDINGS OF FISH EXPECTED:

The commercial fish catch by Jordan has increased from about 99 metric tons in 1957 to 138 tons in 1961.

The Jordan Fisheries Company presently makes almost all of the purchases of fish from fishermen at Aqaba and distributes the fish through its storage space in Aqaba and its one wholesale distributing center in Amman to about 20 fish distributors throughout Jordan. The company is capitalized at Dinar 100,000 (US\$280,000), of which the Government share is Dinar 15,757 (US\$44,000). The company has made only marginal profits or incurred losses since its establishment in 1955, except in 1961 when for the first time an 8-percent dividend was declared.

The Fisheries Company officials hope to expand production within the next few years

to about 600 tons by 1967. The Company owns refrigerated space in Aqaba with a capacity of about 250 tons, of which three quarters is rented out to importers of meat, cheese, and other perishable foodstuffs. Expansion of the refrigerated space devoted to fish could thus easily accommodate the expected increased fish catch.



Two developments are favoring the trend toward increasing Jordan's catch of fish. The Government early in July 1962 issued a temporary ban on fresh fish imports. Imports of fresh fish during 1961 amounted to 554 tons while domestic production was only 138 tons. Since the domestic catch can not hope to match the domestic consumption needs at present, this ban will probably have to be modified soon, according to company officials, in favor of a system to grant import licenses to fish distributors in proportion to their purchases of local fish. The reported agreement with Saudi Arabia to allow Jordanian fishermen to fish in Saudi territorial waters is significant, if implemented, since the area farther down in the Gulf of Aqaba and in the Red Sea is reputed to be rich in fish. There has been a proposal for Germany to supply one to three modern fishing vessels to fish those rich areas, but the proposal is believed to be still in an embryonic stage.

Company officials point to a marketing obstacle which will have to be overcome if fish

Jordan (Contd.):

sales are to be substantially increased. The fish caught near Aqaba generally weigh at least 3 kilograms (about 6.6 pounds). Many fish consumers can afford to buy only small whole fish, and are used to buying whole fish so that offers of fillets or parts of fish are often unacceptable. Company officials believe that good marketing techniques combined with selling only fresh fish will overcome that obstacle. (United States Embassy, Amman, November 12, 1962.)



Republic of Korea

FISHERIES LITERATURE NEEDED BY LIBRARIES:

A resolution requesting assistance for the libraries of the Central Fisheries Experiment Station and the Pusan Fisheries College, both in Pusan, Korea, was passed at the Tenth Session of the Indo-Pacific Fisheries Council held in Seoul, Korea, October 10-25, 1962. Fisheries literature is lacking in both those libraries. Anyone able to donate unneeded papers, duplicates, or gift subscriptions to journals and other periodicals will perform a service for the fishery biologists, gear experts, and technologists of Korea.

Note: Material can be sent direct to the libraries; or appropriately marked material will be forwarded to Korea if sent to the U. S. Bureau of Commercial Fisheries Biological Laboratory, P. O. Box 3830, Honolulu 12, Hawaii.

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DEVELOPMENT OF FROZEN SHRIMP EXPORT INDUSTRY:

Korea's frozen shrimp exports were expected to earn US\$1.5 million in foreign exchange in 1962, with double that amount anticipated in 1963. The development of Korea's frozen shrimp export industry is an example of teamwork in technical assistance.

In 1956, a United States Operations Mission under the United States foreign aid program established a fisheries program in Korea. At that time there was no knowledge of a commercial shrimp resource in Korean waters. Several individuals had tried without success to prepare frozen shrimp for export using raw material taken incidentally to other fisheries.

The catching of shrimp with other fish suggested concentrations of shrimp large enough to support a fishery. Gulf of Mexico shrimp trawl nets were brought to Korea for exploratory work. A vessel belonging to the Korean Government's Central Fisheries Experiment Station in Pusan was equipped to operate otter-trawl gear. The vessel's crew was trained in the use of the gear and a program of exploratory fishing for shrimp was begun under the supervision of the United States Fishery Operations Advisor. When the early work strongly indicated the presence of shrimp in commercial quantities, the exploratory effort was speeded up by using several commercial fishing vessels owned by interested fishermen.

The processing and marketing of Korean frozen shrimp was begun under the guidance of the United States Processing and Marketing Advisor. With the help of United States development funds, a demonstration shrimp-processing plant was set up at the Korean Fisheries Experiment Station. Regulations setting up quality standards for frozen shrimp (as well as processing plant standards) were prepared. The assistance of the United States Eighth Army Veterinary Corps was obtained in evaluating the product and the facility and certifying both as meeting military procurement requirements. Personnel of the Korean fishery products inspection service were given training to qualify them to enforce the new shrimp quality standards. The demonstration shrimp plant was then made available to the Korean fishing industry and used to train supervisory and operating personnel.

Korean frozen shrimp was first sold to the United States Army near the end of 1958. Because of the limited production capacity of the pioneer vessels and the experience that would be gained by processing under the United States Army Veterinary Corps inspection, those wishing to enter the new industry were encouraged to qualify as shrimp processors for the United States Army before attempting to negotiate with foreign buyers.

By mid-1960, the quality of Korean shrimp and the ability of Korean processors to prepare a highly acceptable product had been sufficiently demonstrated to arouse the interest of foreign traders doing import-export business in Korea. Trial shipments were again undertaken and favorable acceptance abroad led to a steadily increasing demand. The number of vessels licensed to operate shrimp

Republic of Korea (Contd.):

trawl gear along the eastern coast of Korea has been increased to 25 and the catching of shrimp by traditional gear is also increasing. There now are eight Korean processing plants qualified to prepare frozen shrimp for export. The eight plants have created at least 1,500 new jobs principally for young women who are required in the preparing and packing operations.

The processors involved and the industry in general have become aware of the export potential of fishery products and are working to develop other items for export. The value of exports of marine products during 1962 is expected to approach \$10 million as compared to less than \$3 million in 1956. (United States Embassy, Seoul, January 7, 1963.)

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LANDINGS OF MARINE PRODUCTS, 1951-1961, AND SIZE OF FISHING FLEET, 1954-1961:

South Korea's landings of marine products in 1961 were 28.7 percent above those in 1960

Table 1 - South Korean Landings of Marine Products, 1951-1961

Year	Fish	Shellfish	Seaweed	Other	Total
	(Metric Tons)				
1961	245,419	43,199	36,989	109,011	434,618
1960	237,226	13,481	27,437	59,640	337,784
1959	266,181	12,661	29,683	73,601	382,126
1958	291,191	15,884	28,759	59,359	395,193
1957	279,767	12,187	34,797	76,406	403,157
1956	257,515	9,778	24,423	49,200	340,916
1955	190,424	6,799	20,019	41,992	259,234
1954	188,941	10,455	17,253	32,887	249,536
1953	185,185	8,433	17,516	46,902	258,036
1952	208,123	9,557	13,199	46,739	277,618
1951	187,474	9,211	19,320	48,632	264,637



Fig. 1 - A Korean mackerel seiner equipped with a power block for hauling in the net.

and 64.2 percent above landings in 1951. Shellfish landings showed a marked increase in 1961.



Fig. 2 - Large seine nets used for mackerel fishing.

The number of mechanized vessels in South Korea's fishing fleet and the total tonnage of the mechanized fleet increased each year between 1954 and 1961. South Korea's

Table 2 - Size of South Korean Fishing Fleet, 1954-1961

Year	Mechanized Vessels		Sail-Powered Vessels	
	Number	Total Tonnage ^{1/}	Number	Total Tonnage ^{1/}
1961	6,803	89,620	2,114	23,257
1960	5,966	80,927	2,036	22,420
1959	5,394	73,074	1,915	21,573
1958	5,050	68,116	1,717	20,913
1957	4,389	58,117	1,694	21,394
1956	4,126	54,185	1,686	21,508
1955	3,804	50,004	1,605	20,472
1954	3,667	47,637	2,676	32,689

^{1/}Metric tons.

sail-powered fishing fleet was cut back sharply in 1955, but in recent years the sail fleet has shown a small increase in both number of vessels and total tonnage. (Monthly Economic Review, Korean Reconstruction Bank, July 1962.)

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PRODUCTION STATUS OF NEW AGAR-AGAR PLANTS:

The construction of a new agar-agar plant in Pusan was approved under the former U.S. International Cooperation Agency (now Agency for International Development or AID) on February 9, 1956, for US\$335,000 plus the use of \$906,992 of counterpart funds (for industrial machinery and motors including extraction tanks, ice-making machinery, pumps, etc.).

Republic of Korea (Contd.):

The objectives of the plant were the production of one million pounds of chemically pure agar-agar annually, with a minimum value of about \$1.50 a pound in the export market; 2 million pounds of high-strength seaweed gelatin; and to aid the economy of Korea. As of June 30, 1962, the buildings were 95 percent completed and equipment 100 percent installed, with completion scheduled in September 1962. Initial operations were withheld pending the installation of additional equipment provided under a fiscal year 1957 project. This project was beset by various problems which resulted in the establishment of a subproject involving an additional US\$120,000 plus counterpart funds of \$97,492 (Typhoon Relief Fund), and \$269,230 (Utilization Loan).

The additional equipment, purchased in April 1960, was delivered by February 1961 and at the end of June 1962, 20 percent had been installed. The remaining 80 percent has been released from customs and was being warehoused at the plant site in Pusan.

This Pusan plant as of August 1962 was being intermittently operated with the equipment already installed, producing about 5 metric tons of crude agar-agar paste per day. Approximately 110,000 pounds of crude agar-agar paste valued at about \$60,000 has been exported to Hong Kong.

The more than usual delays encountered have been due to the sponsor's desire to establish a truly modern production facility based on Japanese patents and equipment from a licensed manufacturer. The remaining problem was that of technical advice to be given by a Japanese engineer expected in August 1962 to supervise the installation of equipment and later the trial operation.

Another new agar-agar plant at Suchon designed to produce 200,000 pounds of agar-agar annually was scheduled to be in operation in September 1962 but financing troubles were expected to delay the opening of that plant.

A third modern agar-agar plant located in Pusan, scheduled to produce 240,000 pounds a year of gelatinous agar-agar has been in operation and was expected to have export earnings of \$450,000 in 1962. The sponsors of this plant also have plants in Mokpo and

Ulsan. (United States Embassy, Seoul, August 31, 1962.)



Malaya

CANNED TUNA IN BRINE EXPORTS TO U. S.:

The Malayan Marine Industries (a tuna packing company located in Penang and jointly operated by Japanese and Malayan interests) started packing tuna in brine in late 1962 and is reported to have exported a small quantity of its product to the United States. Pending a report on the acceptability of this trial shipment, the company plans to fix a price on future exports to the United States.



M/V Shoyo Maru, a research vessel of the Japanese Fisheries Agency visited Penang early in 1962 before going on to search for tuna near Mauritius.

The Malayan plant initially began operations in February 1960, packing canned tuna in oil for the European market. In December 1961, the Japanese Government allotted to that company a production quota of 36,000 cases of tuna in brine for export to the United States, but it was not until November 1962, according to press reports, that the plant began to pack tuna in brine. (Suisan Tsushin, December 25, 1962, and other sources.)

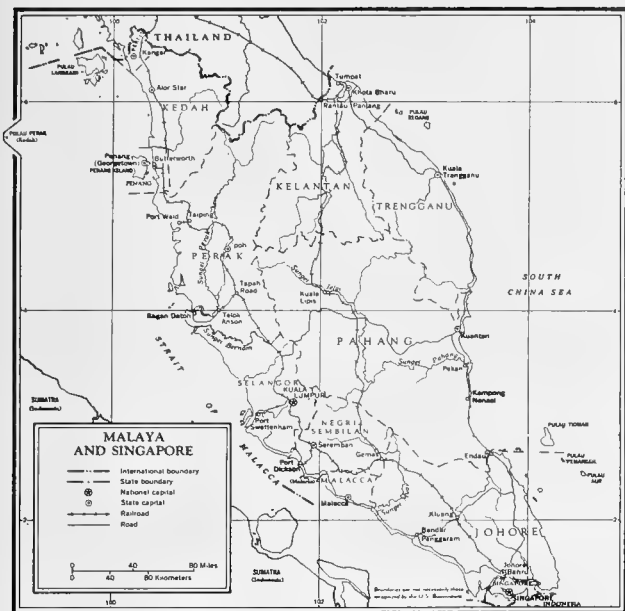
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JOINT MALAYAN-JAPANESE TUNA COMPANY RECEIVES FINANCIAL AID:

The Japanese Overseas Fishing Company which operates the joint Japanese-Malayan tuna packing company (began operations in Penang, Malaya, February 1960) reportedly will receive financial assistance from the National Federation of Japanese Tuna Fishery Cooperative Associations (NIKKATSUREN). The cooperative, at its director's meeting held on December 5-6, 1962, voted to secure a loan from the Agriculture and Forestry Central Cooperative Bank, which it would advance

Malaya (Contd.):

to the Overseas Fishing Company to provide a continuous operating fund (to be used for purchase of tuna landed at Penang) of 300 million yen (US\$833,000) per month for its Malayan enterprise.



The Malayan enterprise hopes to purchase, on an average, 1,900 short tons of tuna each month from five clipper vessels and 16 ice boats that are expected to unload their catches at Penang. Of that amount, the company plans to ship approximately 800 tons back to Japan. A 1,000-ton-capacity cold-storage plant and a cannery with a daily production capacity of 500 cases of canned tuna are being constructed at Penang for the Malayan firm, according to Suisan Tsushin, December 8, 1962.)

Editor's Note: The Malayan joint firm originally was authorized to pack only canned tuna in oil for export to Europe. In December 1961, the Japanese Fisheries Agency authorized that company to annually export to the United States 36,000 cases of canned tuna in brine. However, due to the unprofitable nature of the operation, the Malayan cannery temporarily suspended packing tuna in brine until November 1962. In April 1962, the Fisheries Agency authorized the Overseas Company to land 6,000 short tons of fresh tuna at Penang for freezing and transshipment to the United States. At the same time, the Agency designated both Penang and Singapore as transshipment ports

and authorized a combined frozen tuna transshipment quota of 4,000 tons for those two ports.



Mexico

DIRECT TAXES ON FROZEN SHRIMP EXPORTS:

The present Mexican Federal and Municipal direct taxes on frozen shrimp exports result in approximately the following charges:

From all east coast points and the west coast points of Salina Cruz in Oaxaca and Santa Rosalia in Baja California:

	U. S. Cents Per Lb.
Federal taxes:	
Export, specific	0.09
Export, ad valorem . .	3.32
Severance	1.11
Municipal tax	0.07
Total Federal and Municipal taxes . .	4.59

From other Mexican west coast points the Federal export ad valorem tax is about 3.55 U. S. cents per pound and other taxes are the same as shown above, resulting in a total tax of about 4.82 U. S. cents per pound.

The Mexican State of Campeche levies a separate and additional tax on shrimp exports of 2.21 U. S. cents per pound, so combined Mexican taxes on frozen shrimp exports from that State amount to about 6.80 U. S. cents per pound. (United States Embassy, Mexico City, December 20, 1962.)

Note: In computing approximate tax rates, the following factors were used: 12.50 Mexican pesos equal US\$1; one metric ton equals 2,200 pounds.

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SOVIET FISHING VESSELS ATTACHED TO THE CUBAN FLEET ENTER MEXICAN PORT FOR SUPPLIES:

Early in December 1962 two Soviet fishing vessels, the Obdorski and the Omar, both displacing slightly over 500 tons and both attached to the Cuban fishing fleet (Flota de Cuba), arrived at the Mexican port of Veracruz after requesting permission to enter the port to obtain water and food. Russian crew members of the two vessels said they had no idea why the vessels came to Mexico instead of Havana, which was their destina-

Mexico (Contd.):

tion. The vessels remained in port for several days and then proceeded out to sea again.

A conservative daily newspaper carried an editorial commenting on this evidence of Soviet participation in the Cuban fishing fleet and expressing concern that the Soviet fishermen, with their more advanced fishing techniques, could contribute to the loss to Mexico of the great wealth represented by marine life in Mexican waters. (United States Embassy, Mexico City, December 12, 1962.)



Morocco

EXPORTS OF SARDINES TO FRANCE MAY BE RESTRICTED:

A French commercial delegation came to Morocco on December 3, 1962, to discuss the status of certain French quotas (including sardines) which apply to Moroccan exports to France. The French delegation included officials of the Ministry of Finance, the Ministry of Agriculture, the Merchant Marine, and representatives from the French Embassy at Rabat.

According to the press, France during the summer months will restrict or stop, if necessary, Moroccan exports of sardines if the sardine catch in France is a good one. This agreement was made apparently to avoid any incident such as occurred during the summer of 1962 when the French sardine fishermen actively intervened to block imports of sardines from Morocco. (United States Embassy, Rabat, December 14, 1962.)



Nicaragua

FISHING LICENSES GRANTED TWO CARIBBEAN COAST COMPANIES:

The Government of Nicaragua has granted fishing licenses to two firms to operate commercial fishing enterprises from Caribbean coastal ports.

A commercial fishing license was granted to one Nicaraguan firm to fish for shrimp, spiny lobster, crab, oysters, clams, macker-

el, tuna, sardines, corbina, and miscellaneous fish for bait. Specifically excluded are turtles. The license is granted for 10 years on condition that the firm comply with the various regulations set forth in the General Law on the Exploitation of Natural Resources and the Special Law on the Exploitation of Fish and Shellfish. The firm is required to begin operation of its plant in Puerto Cabezas within 90 days of the date of the decree (Decree No. 15-DRN, published in *La Gaceta* No. 216 of September 22, 1962). The firm's production is expected to be primarily for export.



A second license was granted to another firm for five years to fish for all types of fish and shellfish except turtles. Compliance with the two laws and regulations mentioned above is required. The firm was given 45 days from the date of the decree (Decree No. 17-DRN, published in *La Gaceta* No. 264 of November 19, 1962) to get the plant on Corn Island into operation. This plant will also produce for export and it is expected to concentrate on the spiny lobster fishery.



Norway

EXPORTS OF CANNED FISH, JANUARY 1-SEPTEMBER 22, 1962:

Norway's total exports of canned fish during the period January 1-September 22, 1962, were 19.8 percent greater than in the same period of 1961. All of Norway's important canned fish products, except soft herring roe and shellfish, were exported in greater quantity in 1962. Exports of

Norway (Contd.):

canned smoked brisling were up 39.8 percent and exports of canned smoked small sild were up 24.2 percent.

Norwegian Exports of Canned Fish, January 1-September 22, 1962 ^{1/}		
Product	1962	1961
	.. (Metric Tons) ..	
Smoked brisling	4,419	3,160
Smoked small sild	10,255	8,258
Kipperd herring	3,143	2,673
Soft herring roe	682	709
Sild delicatessen	355	218
Other canned fish	2,397	2,496
Shellfish	1,359	1,364
Total	22,610	18,878

^{1/}Preliminary.

During January-August 1962, Norway's total exports of canned fish showed an increase of 17.3 percent in quantity and 21.9 percent in value over exports in the same period of 1961, due mainly to an increase in exports to the United States and the United Kingdom. There was a sharp decline in exports to South Africa.

Norway's Total Exports of Canned Fish, January-August 1961-62 ^{1/}			
Year	Quantity	Value	
	Metric Tons	Million N. Kr.	Million US\$
1962	19,786	100.2	14.0
1961	16,863	82.2	11.5

^{1/}Preliminary.

The United States was the leading buyer of Norwegian canned fish during January-August 1962, taking 46.1 percent of total exports or 9,122 metric tons valued at N. kroner 46.8 million (US\$6.5 million) as compared with 6,677 tons valued at N. kroner 35.6 million (US\$5.0 million) during the same period of 1961. Other important markets for Norwegian canned fish in 1962 were the United Kingdom, Australia, Canada, East Germany, and South Africa.

At the end of the brisling canning season on October 15, 1962, the brisling pack equaled 414,818 standard cases (100 3 3/4-oz. cans), as compared with the 1961 pack of 424,577 standard cases. The small sild pack between May 1-October 20, 1962, amounted to 391,956 cases, as compared with 394,248 cases in the corresponding season in 1961. Cannerys were disappointed by the catch and supply of small sardines for sild packing in the fall of 1962. The supply of mackerel for canning up to October 13, 1962, was reported as 2,062 tons as compared with 606 tons in the same period of 1961. As usual there was some canning of crab and shrimp in the fall of 1962, but pack data are not yet available (Norwegian Cannery Export Journal, November 1962).

FISHERIES RESEARCH VESSEL EXPLORES WATERS OFF WEST GREENLAND:

In April and May of 1962, the Norwegian research vessel G. O. Sars made a cruise (April 9-May 16, 1962) off the coast of west-

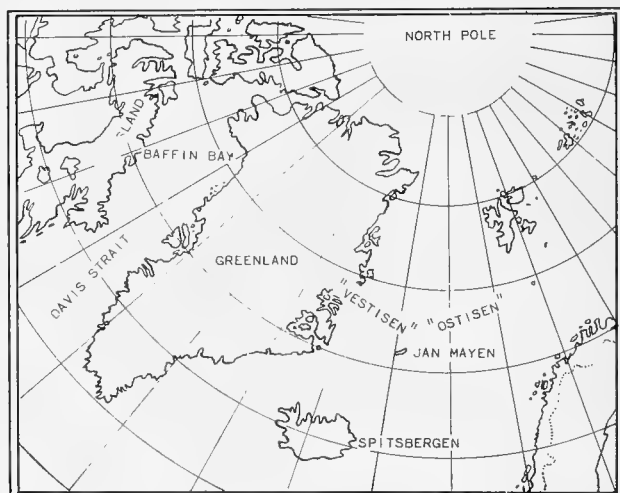
ern Greenland to study cod and halibut. The results of that cruise are to be compared with a similar trip made in April 1959.



Norwegian research vessel G. O. Sars.

The investigation itself began at Noname Bank on April 19 and ended off Vestmannaeyar, Iceland, on May 13.

Off Iceland, the research vessel took part in an international sampling project with trawls, started on the initiative of the International Council for the Exploration of the Sea (ICES).



The ice conditions off western Greenland were mainly normal. Broken ice and occasionally pack ice were encountered over the entire Julianehaps Bay and Nanortalik Banks so it was not possible to fish there at the start of the season. At the Holsteinsborg Deep, some drift ice was encountered but it did not hinder fishing.

Hydrographic and fishing stations were occupied off Greenland's west coast in the general areas of Noname Bank, Fylla Banks, and Sukkertoppen. The surface water temperature was somewhat lower than at the

Norway (Contd.):

same time in 1961, in the intermediate and lower depths about the same as in 1961.

The relatively low temperature of the surface water was probably not the result of a stronger flow of arctic water, but apparently the direct result of ice and the stable weather conditions.

Ten fishing stations were made with cod lines and the catch of cod was consistently over average.

In the Holsteinborg Deep and along the western edge of the Little Hellefisk Bank, cod fishing was very good and samples were taken of 1,174 cod. In addition, 1,796 were measured.

The size varied somewhat between the different catches, but the majority were suitable for salting.

All the cod were in excellent condition. The catch was dominated by the 1953 brood. In addition there were large numbers of cod hatched in 1956 and 1957.

At two locations tests were made with halibut lines and only five halibut were caught. Thirty-nine halibut were also caught on the cod lines. All were small and not mature and 32 were marked--all with yellow plastic buttons, in the left gill. (*The Fishing News*, September 7, 1962, abstracted from an article by a fisheries scientist of the Norwegian Sea Research Institute.)



Pakistan

FISH HARBOR ON BAY OF BENGAL TO BE BUILT:

Construction of a fish harbor on the Bay of Bengal will be started by the Government of Pakistan sometime after July 1963. The harbor, costing Rs.106 million (US\$22 million) will be located at Chaktai, a small town on the Karnaphuli River near Chittagong. The development of what seem to be rich fisheries in the Bay of Bengal should be greatly aided by a modern fish harbor. Private capital in Pakistan has shown an interest in buying the mechanized vessels and modern gear needed to make the new harbor



worthwhile. (United States Embassy, Karachi, January 5, 1963.)

In 1962, both the Government of Pakistan and private fishery firms in Pakistan invited United States firms and investors to participate in various joint United States-Pakistani commercial fishing ventures.



Peru

FISH MEAL MARKETING PROCEDURES:

The Consorcio Pesquero del Peru S. A., was not given legal control over all Peruvian fish meal exports by Peruvian Decree-Law No. 14228, as was previously indicated. Decree-Law No. 14228 was advisory rather than mandatory in character, according to the latest report on its interpretation.

The Consorcio Pesquero del Peru S.A., (Fisheries Consortium of Peru) is the marketing agency for a large percentage of Peru's fish meal production. The marketing system described in Decree-Law No. 14228 would give the Consortium complete control over all Peruvian fish meal exports if adopted, but opposition may prevent its adoption.

It has been reported that the Consortium is naming sole importers in Belgium, in the Netherlands, and in West Germany to receive Consortium fish meal shipments to those countries. It is not clear at present how the Consortium plans to handle sales to the United States. One report indicates that the Consortium will name less than seven importers

Peru (Contd.):

in the United States. (United States Embassy, Lima, December 10, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 83.

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FISHERIES TRENDS, THIRD QUARTER 1962:

Peruvian fish meal exports in January-September 1962 amounted to 802,000 metric tons, up 46.3 percent from exports of 548,158 tons in the same period of 1961, and 94,000 tons more than were exported in the entire year 1961. Peruvian fish meal production in the first nine months of 1962 amounted to 727,285 tons, according to preliminary data from the International Association of Fish Meal Manufacturers. A representative of the Peruvian fish meal industry estimated that fish meal production in Peru had increased 37 percent in the 12-month period ending August 31, 1962. He thought that the industry would grow at the same rate for another 12 months, after which production would level off.



Callao--one of Peru's principal fishing ports.

Peruvian fish oil exports in 1962 were expected to reach 125,000 metric tons, which would be an increase of 22.1 percent over exports of 102,306 tons in 1961. A value of US\$11.3 million is forecast for the estimated 1962 fish oil exports, which would be an increase of only 4.6 percent over the \$10.8 million received for 1961 fish oil exports. The price of Peruvian fish oil for export, which averaged \$106 per ton (4.8 U. S. cents a pound) in 1961, is expected to average only \$90 per ton (4.1 cents a pound) in 1962.

It appeared that the value of Peru's exports of all fishery products in 1962 will reach \$127 million, which would be nearly \$56 million more than the total value of fishery exports in 1961. Greater exports of fish meal at better prices are the main reason for the estimated increase in value. The profitable fish meal industry has attracted great interest on the part of investors and created a demand for new plants. New simplified procedures for the issuance of licenses for fish meal plants were established by the Government in August (Supreme Decree No. 11 published in El Peruano, Aug. 29, 1962). In the past it usually took several months to obtain a license even under the best of conditions, but under the new system licenses may be issued within a week after application. The average cost of installing and starting a fish meal plant in Peru was estimated recently at \$1 million. The fishing industry appears to have been a major contributor to the Peruvian economy in the third quarter of 1962. Sales of machinery and equipment to the fishing industry expanded when most other sales dropped off. (United States Embassy, Lima, November 9, 1962.)



Philippine Republic

IMPROVEMENT OF FISHING INDUSTRY STRESSED BY PRESIDENT:

For the second time in recent weeks the President of the Philippines has stressed his determination to improve the fishing industry. In a December 6, 1962, speech in Palawan he said that he intends to make the Philippines self-sufficient in fish in order to eliminate the costly importation of canned fish which in 1961 was valued at US\$16 million.

The Emergency Employment Administrator has announced a P15 million (about US\$3.9 million at free rate of exchange) fishery development project beginning December 14, 1962. The project will establish a network of 16 fishing ports, refrigeration stations, fish farms and nurseries in appropriate coastal provinces. Also on December 14, the President was scheduled to turn over Pier 14 in the Manila North Harbor area for the exclusive use of the fishing industry.

In other fishing developments, the Fisheries Director stated that a Norwegian expert was scheduled to arrive in January 1963

Philippine Republic (Contd.):



on loan from the United Nations Foods and Agriculture Organization (FAO) to assist in the development of a purse-seine fishery. He also said that a deep-sea fishing institute, a joint project of the Philippine Government and the FAO, would be opened by mid-1963.

U. S. FRESHWATER FISH BIOLOGIST ACCEPTS FAO ASSIGNMENT:

A fresh-water fish biologist from the United States (Smithville, Tenn.) has been assigned to a technical assistance project in the Philippines by the Food and Agriculture Organization. The appointment is for 12 months.

The biologist, who was due to arrive in Manila on November 28, 1962, will assist the Philippine Government in operating the Freshwater Fisheries Investigations Unit, especially on work being done at Laguna de Bay. He will also advise the Government

on the best ways of carrying out inland fishery surveys and research.

Until his present FAO assignment, he was a fisheries research biologist with the U. S. Fish and Wildlife Service at Stuttgart, Ark. He also has acted as district biologist for the Tennessee Game and Fish Commission and as a fisheries management biologist with the U. S. Fish and Wildlife Service at Atlanta, Ga.



Poland

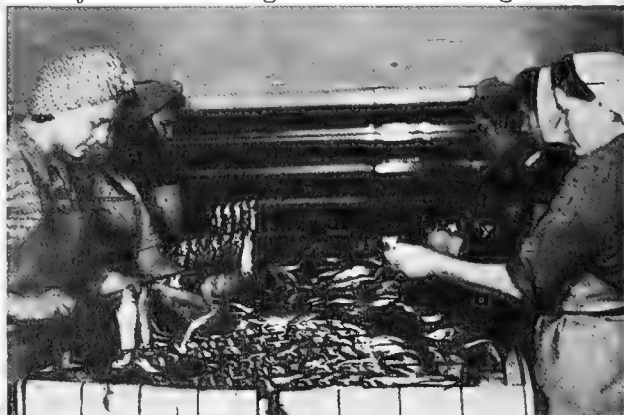
LANDINGS OF MARINE PRODUCTS AND SIZE OF FISHING FLEET, 1961:

In 1961, Poland's fleet of sea fishing vessels gained 1 factory trawler, 2 trawlers, and 6 cutters, but there was a decline in the number of vessels classified as "luggers and trawlers." The gross registered tonnage of the fishing fleet in 1961 was 4.7 percent greater than in 1960.

Table 1 - Poland's Fleet of Fishing Vessels, 1950, 1955, and 1960-1961

Type of Vessel	1961	1960	1955	1950
... (Number of Vessels) ...				
Factory trawlers	2	1	-	-
Super trawlers	53	53	8	-
Trawlers	15	13	20	24
Luggers and trawlers . . .	46	50	34	-
Luggers	3	3	3	3
Cutters	538	532	397	338
Auxiliary vessels	3	3	2	-
Total	660	655	464	365
Total Gross Registered Tons	91,700	87,600	43,200	18,200

Marine landings by Poland's fishing fleet in 1961 were only about one percent greater than in 1960. An increase in landings of sprats and unclassified fish was almost offset by a decline in groundfish landings.



A Polish fish processing plant in Gdynia. Preparing herring for hot smoking.

Poland (Contd.):

Table 2 - Poland's Marine Landings of Fishery Products, 1950, 1955, and 1960-1961				
Fishery	1961	1960	1955	1950
	(Metric Tons)			
Groundfish	41,100	51,100	40,300	48,200
Herring	93,600	93,600	52,000	9,500
Sprats	11,300	9,900	5,100	1,200
Other	23,400	13,400	9,700	7,300
Total	169,400	168,000	107,100	66,200

Marine landings in 1961 were up 155.9 percent from those in 1950, due mainly to an almost tenfold increase in herring landings. The increase in landings reflects the rapid expansion of the Polish fishing fleet. (Concise Statistical Yearbook of the Polish People's Republic, 1962.)

Note: See Commercial Fisheries Review, November 1961 p. 63.

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LONG-RANGE FISHERY PLANS CALL FOR WIDE-RANGING FLEET OF VESSELS:

Plans for expanding Poland's fishing potential and using foreign bases or ports, especially in West Africa, in order to expand fishing operations in South Atlantic waters, were discussed in an article published by Tygodnik Gdanski.

Poland's long-term plans for the development of the fishing industry in the years 1961-1980 call for a fish consumption of 11.5 kilograms (about 25.3 pounds) per capita. The realization of this goal (plus exports of 80,000 metric tons of fish and the production of 65,000 tons of fish meal per year) will require landings amounting to 900,000 tons in the year 1980.

In order to achieve this goal it is planned to develop fishing by factoryship trawlers and refrigerated trawlers, as well as to expand the fleet for expeditional purposes basing on specialized motherships. The North Atlantic, the most productive fishing ground, is envisaged as the fishing area of the deep-sea fleet.

At present the Polish fishing fleet exploits the Northwest Atlantic fishing grounds by means of factoryships. However, consideration should be given to the possibility that the dynamic development of world fishing carried on in the Northwest Atlantic can create a situation in which those rich fishing grounds will fail to provide good catches for Polish vessels.

The article points out that Poland should not either rely too much on temporary good fishing in the Greenland area, but should look for new fishing areas for her present and future fleet. In the light of development prospects of the fleet, and considering the fact that the range of a factoryship trawler based in Poland, amounts to 4,500 miles, of special interest to Poland should be the region along the northwest and central Africa starting at Cap Blanco, to the Gulf of Guinea. The exploitation of fishing grounds rich in fish off Angola, the grounds near South Africa, the Caribbean Sea, the Brazilian Shelf, and the rich fishing grounds near the Falkland Islands off the coast of South America will be feasible if the vessels are based at foreign ports or if motherships are used.

The essential task of the fishing fleet, the article continues, is to provide the Polish population with a sufficient amount of fish. But it is possible, especially during the period of finding new fishing areas outside the home-port range of the Polish fleet, situations can arise when part of the catch will be sold in countries with which Polish fishing enterprises cooperate. Such cooperation, for example, was started with Guinea in 1961.

Another cooperative venture began with the signing of an agreement between Poland and Nigeria for deliveries of fish to Lagos, Nigeria. In implementing this agreement two trawlers, the Neptun and the Mamry have set sail for African waters. Besides the profits from the sale of fish from the first fishing expedition, of considerable importance to Poland is furthering of economic cooperation with Nigeria. The high-quality fish unloaded in a foreign port will demonstrate the efficiency of Polish fishing vessels. Therefore, it may be expected that the new African countries will soon become the important customers of Polish shipyards.



South Africa Republic

LEGISLATION TO EXTEND TERRITORIAL WATERS PROPOSED:

In a statement released on December 21, 1962, the South African Prime Minister announced that the Government proposes to introduce legislation to extend the limit of the territorial waters of South Africa and South-

South Africa Republic (Contd.):

West Africa to 6 nautical miles from baseline, and the fishing limit to 12 nautical miles from baseline.

He stated that the effect of the legislation will be to apply the 6 plus 6 formula which narrowly failed of adoption at the 1960 Law of the Sea Conference, and which the Government is satisfied commands the widest measure of international acceptance. With respect to the continuation of fishing rights in the outer 6 miles, it is believed that in South African and South-West African coastal waters no problems of any significance will arise. According to the Prime Minister, the Government is prepared to consider sympathetically representations of any state which might consider its interests affected by the new legislation.

If international agreement on the breadth of territorial waters is reached after legislation is enacted, South Africa would consider amending the legislation to bring it into line with whatever had been internationally agreed upon. The Prime Minister also announced the Government's intention to accede to four 1958 International Conventions on the Law of the Sea: Territorial Sea and the Contiguous Zone; the Continental Shelf; the Conservation of the Living Resources of the High Seas; and the High Seas. (United States Embassy, Pretoria, December 22, 1962.)



Switzerland

FISH-SCALING MACHINE DEVELOPED:

A Swiss manufacturer has developed a device called the "Roto-Fix," which is used for scaling fish. The machine is in the form of a rotary scraper and a flexible shaft, driven at high speed by an electrical motor. Working cleanly and quickly without danger for the operator, the Roto-Fix device is expected to render a service in restaurants, hotels, and other large catering establishments. (United States Embassy, Bern, December 14, 1962.)

* * * * *

WATCH FOR DIVERS:

A watch factory at Chaux-de-Fonds, Switzerland, has created a new watch of a special

type for the use of underwater divers. The watch is known as the "Vulcain Cricket Nautical." Equipped with a clock-striking mechanism and a decompression table, this diver's watch can play a double role under the water by reminding the diver when it is time to start for the surface and enabling him to see at a glance the various times and depths at which he will have to pause in order to avoid faulty decompression.

The clock-striking mechanism allows two divers to signal each other acoustically considerably beyond their range of vision. In tests the watch has stood up to pressures equivalent to depths of approximately 1,000 feet. (United States Embassy, Bern, December 14, 1962.)



U.S.S.R.

LANDINGS OF FISHERY PRODUCTS SURPASS GOAL IN 1962:

The Soviet Union's annual plan for fishery landings (including whales and other mammals) of 3,907,000 metric tons (about 8.6 billion pounds) for 1962 was fulfilled by December. The landings for the first 11 months of 1962 reached 3,907,360 tons as compared with the total catch for the year 1961 of 3,724,000 metric tons (8.2 billion pounds).

The catch goal for 1963, as announced by the Premier, is 4,220,000 tons (9.3 billion pounds).

* * * * *

TWO MORE FISH FREEZING VESSELS CHRISTENED IN DANISH SHIPYARD:

The M/S Davydov and the M/S Sovietsk were christened December 21, 1962. The refrigerated vessels are the last of a series of four identical fish carriers ordered by



Fig. 1 - A side view of the Soviet fish carrier M/S Skryplev, the first of a series of four identical vessels.

U. S. S. R. (Contd.):

V/O Sudoimport, Moscow, from a Copenhagen shipyard. The M/S Skryplev was the first in the series and was delivered in late November 1962. The second vessel, the M/S Vitus Bering, which was launched June 9, 1962, should be ready for delivery early in 1963. The vessels are designed to dress and freeze fish which are taken aboard by way of a stern chute from accompanying trawlers.



Fig. 2 - Stern view of Soviet fish carrier M/S Skryplev showing stern chute.

Each of the vessels has a dead weight of about 2,600 tons, is 91 meters (298.5 feet) in length between perpendiculars, and has a beam of 16 meters (52.5 feet). The main engine on all of the vessels is a 6-cylinder Diesel developing 3,530 horsepower.

The director of the shipyard building the vessels announced that his firm has built 37 vessels for the U. S. S. R. in the past 30 years, of which 25 were refrigerated vessels for V/O Sudoimport. (European Regional Fisheries Attache, United States Embassy Copenhagen, January 2, 1963.)



United Kingdom

FISHERY LOANS INTEREST
RATES REVISED:

The British White Fish Authority announced that, as a result of a change in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from November 17, 1962, will be as follows:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $5\frac{1}{8}$ percent, increase $\frac{1}{4}$ percent; on loans for more than 5 years, but not more than 10 years, $5\frac{3}{8}$ percent, increase $\frac{3}{8}$ percent; on loans for more than 10 years, but not more than 15 years, $5\frac{3}{4}$ percent, increase $\frac{1}{4}$ percent; on loans for more than 15 years, but not more than 20 years, $5\frac{7}{8}$ percent, increase $\frac{1}{8}$ percent.

Processing plants: on loans for not more than 15 years, $6\frac{3}{8}$ percent, no change; for more than 15 years, but not more than 20 years, $6\frac{7}{8}$ percent, no change.

The rates on loans made before November 17 are unchanged.

Note: See Commercial Fisheries Review, November 1962 p. 83.

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FISH STICKS ACCEPTED
BY CONSUMERS:

Fish sticks (known as fish fingers in Britain) in just over seven years have become a regular part of Britain's national diet. They have now been recommended for inclusion in the Cost of Living Index.

The British company, which introduced the product to Britain in 1955, has evolved a new recipe, approved by panels of housewives and thoroughly tested in the company's research and development department at Great Yarmouth. At the company's Grimsby factory, new machinery has been designed to cut the fish.

The firm's product group manager for fish and fish products said:

"Fish fingers were introduced in 1955 and have since become a major part of the trend towards convenience foods which was noted by the National Food Survey Committee in its recent annual report."

The firm has set the pace in the British market, with 7 out of 10 housewives preferring the firm's brand. The company uses mostly cod fillets to produce its fish sticks.

At Grimsby the firm has a large and up-to-date plant. More fish sticks are produced there than in any other plant in Europe and many hundreds of tons are shipped each year to Australia and elsewhere as part of the company's expanding export business.

This illustrates the success of the product, the sales of which have multiplied ten times since it was introduced in 1955, for it has been estimated that more than 600,000,000 fish sticks (in number) were sold in Britain in 1961.

United Kingdom (Contd.):

Because of their impact on the total frozen food market (they represent some 16 percent of the total business and are second only to peas in importance), fish sticks have made a vital contribution to the growth and stability of the fishing industry in Great Britain.

In 1961, largely because of the demand for fish sticks, as much as 16 percent of the fish landed in Britain was quick-frozen, compared with only 8 percent in 1955 when they were introduced. (*The Fishing News*, British periodical, September 21, 1962.)



Zanzibar

FISHERIES DEVELOPMENT COMPANY TO SEEK EXPORT MARKETS:

The Government of Zanzibar has announced the formation of the Zanzibar Fisheries Development Company. This joint venture, in which the Government of Zanzibar holds the controlling interest, is designed to alleviate the British Protectorate's excessive economic dependence upon a single crop, cloves. Zanzibar is located off the east coast of Africa near Tanganyika.

The agreement is between the Zanzibar Government and a commercial fishing firm. The commercial company is contributing craft, gear, equipment, technicians, and expert knowledge. The new development firm commenced operation on November 11, 1962.

The main objective is to develop an export trade in fish products by exploiting fisheries resources which are beyond the present scope of local fishermen and by setting up a marketing service to handle fish caught by local fishermen which are surplus to local market requirements and suitable for the export trade. The new company will not interfere with fish supplies to local markets for so long as these are adequately supplied by local fishermen.

In order to achieve these objectives the company will be erecting necessary processing plants in the immediate future. A fish-curing plant capable of smoking and/or salting five tons of fish a day, with room for expansion to double

this amount, was expected to be in operation within three months. A cold storage of 60 tons capacity with deep-freezing and ice-making plants will be in operation within 12 months. The erection of a cannery will be considered when the processing plants outlined above have been erected and are in full operation.

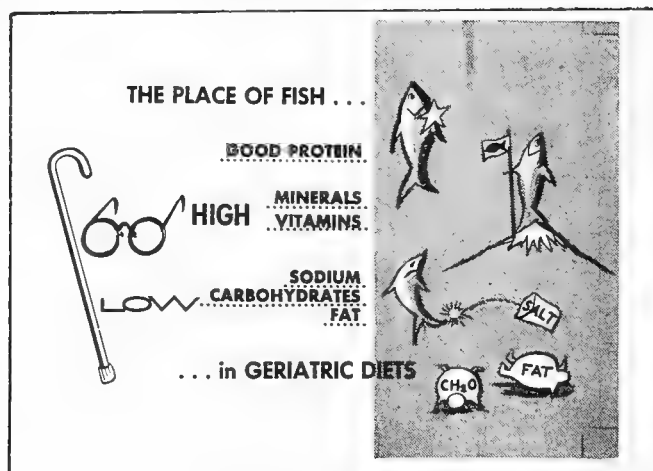
The two fishing units of the new company will initially concentrate on the catching of sardines and Indian Ocean mackerel by use of purse seines. It has been proved that those fish can be caught in quantity throughout the year in Zanzibar waters. Two additional fishing units will be built by the company in its own workshops during the next 12 months.

The British Freedom from Hunger Campaign has approved a scheme to investigate the tuna fishing potential in those waters. These trials will be conducted by the new company in collaboration with the East African Marine Fisheries Research Organization. Tuna schools are known to abound in those waters and it is confidently expected that their investigations will result in the large-scale development of tuna fishing by the company in the future.

The marketing service to purchase and process surplus fish caught by local fishermen will be established as soon as the cold storage is in operation. This service will undoubtedly provide the incentive necessary to develop local fisheries which are at present handicapped by the limited local market. Local fishermen will also be given practical training in the use of advanced techniques to enable them to play a full part in this development in the years to come.

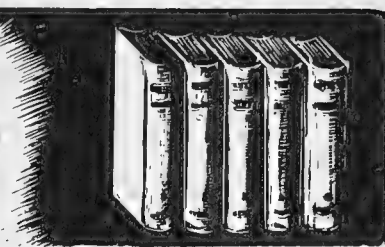
Various countries are considered as possible export markets. It is anticipated that white meat tuna can be successfully sold in the United States and Europe. Northern Rhodesia, the Congo, and Greece are considered as markets for salted fish and Ceylon is thought to be a potential market for both dried and salted fish. The construction of a fish meal plant is projected for the future if conditions are found to be favorable. It is estimated that approximately 150 persons will be employed by the Fisheries Development Company by the end of 1962.

The Government of Zanzibar is placing heavy emphasis on the Fisheries Development Company. One senior Department of Agriculture official has termed it "our only hope for the future" as the Government has been unable to find additional agricultural crops that could be successfully cultivated in Zanzibar in order to produce substantial export revenues. (United States Consulate in Zanzibar, November 27, 1962.)





FEDERAL ACTIONS



Department of Health, Education and Welfare

FOOD AND DRUG ADMINISTRATION

POLICY ON PACKAGED PRODUCTS "WEIGHED AT TIME OF SALE" AFFECTS FISH FILLETS:

In place of the net weight statement on foods such as bananas, meat, and fish fillets that are wrapped in cellophane or similar film at the production level, packers have been permitted to substitute a statement or instructions on the wrapper that the article is to be weighed and marked at the time of resale. But a new "statement of interpretation" issued by the U. S. Food and Drug Administration in the Federal Register of December 4, 1962, considers the articles mentioned as food in packaged form.

Therefore, that agency ruled that those products must bear a new weight statement on the wrapper when shipped in interstate commerce. The new policy insists that fish fillets that are prepackaged in cellophane or similar films bear an accurate statement of the net contents, whether or not it is intended that the package be weighed and marked at the time of retail sale.

Since April 25, 1940, the producers of individually- or consumer-wrapped frozen fish products have enjoyed an exemption from marking the net weight on wrapped fish packed in 5, 10, and 20-pound cartons at the time of packing. The recent ruling cancels the old exemption.

The ruling as published in the December 4, 1962, Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER A—GENERAL

PART 3—STATEMENTS OF GENERAL POLICY OR INTERPRETATION

Net Weight Statement on Foods in Package Form That May Be Weighed at Time of Retail Sale

Under the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (sec. 701(a), 52 Stat. 1055; 21 U.S.C. 371(a)) and delegated to the Commissioner of Food and Drugs by the Secretary (25 F.R. 8625), and pursuant to the provisions of the Administrative Procedure Act (sec. 3, 60 Stat. 237, 238; 5 U.S.C. 1002), the following statement of interpretation is issued:

§ 3.204 Net weight statement on foods in package form that may be weighed at time of retail sale.

(a) The Food and Drug Administration has been requested to comment on industry proposals to omit the net weight statement on foods such as bananas, meat, and fish fillets that are prepackaged in cellophane or similar films and to substitute therefor statements or instructions on the label that the article is to be weighed and marked at time of retail sale. The articles that are the subject of these proposals would be food in packaged form under the Federal Food, Drug, and Cosmetic Act. Sections 403(e) (2) and 405 of the act contain authority permitting reasonable variations from the required label statement of the quantity of contents under certain conditions arising in good packing practices; exemptions for small packages and open containers of fresh fruits and fresh vegetables; and exemptions for food which is, in accordance with the practice of the trade, to be processed, labeled, or repacked at establishments other than those where originally processed or packed. However, there is no authority in the statute for exemptions such as those requested in this instance. Therefore, any such food shipped in domestic

interstate commerce or imported into the United States shall bear, among other mandatory statements on the label, an accurate statement of the net contents, whether or not it is intended that such package be weighed and marked at the time of retail sale. However, under the pertinent regulations, if preferred, a minimum net weight statement may be used, rather than an average net weight statement, if all units are in excess of the minimum quantity stated and if the variations above the stated minimum are not unreasonably large.

(b) This statement cancels that contained in Trade Correspondence Letter No. 258 (TC-258), issued April 25, 1940, with reference to a similar situation involving the labeling of individually wrapped frozen fish with a statement of net contents.

(Secs. 403(e) (2), 701(a); 52 Stat. 1047, 1055; 21 U.S.C. 343(e) (2), 371(a))

Dated: November 28, 1962.

GEO. P. LARRICK,
Commissioner of Food and Drugs.



Department of the Interior

FISH AND WILDLIFE SERVICE

PROGRAM REVIEW ASSISTANT TO COMMISSIONER NAMED:

Joseph F. Puncochar of Baltimore, a long-time Federal official, has been named Assistant for Program Review in the office of the Commissioner of the Fish and Wildlife Service, Secretary of the Interior Stewart L. Udall announced on December 20, 1962. He succeeds O. Lloyd Meehan who retired December 8, 1962.

Puncochar, 50, began his new duties January 7, 1963. He was formerly research Director for the Maine Sardine Council in Bangor, a position he held for two and a half years. Prior to his present job he had been with the Fish and Wildlife Service for 24 years.

In his new position, Puncochar will be responsible for over-all Fish and Wildlife Service program review and appraisal for the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife. His responsibilities will cover such diverse programs as increasing the efficiency of the Nation's commercial fishing industry to preserving the 32 remaining wild whooping cranes.

BUREAU OF COMMERCIAL FISHERIES

REGULATIONS FOR ISSUANCE OF DESIST ORDERS AGAINST POSSIBLE RESTRAINT OF TRADE BY FISHERY COOPERATIVES:

The Department of the Interior published in the Federal Register of December 19, 1962,

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER I—FISHERY MARKETING COOPERATIVES

PART 290—ISSUANCE OF CEASE AND DESIST ORDERS BY THE GOVERNMENT

On pages 842 through 843 of the FEDERAL REGISTER of August 31, 1962, there was published a notice and text of proposed new Part 290 of Title 50 Code of Federal Regulations. The purpose of the new part is to set up rules of procedure for issuance of cease and desist orders under section 2 of the Fishery Cooperative Marketing Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521-522), and section 4(e) of 1939 Reorganization Plan (53 Stat. 1433).

Interested persons were given until September 30, 1962, to submit written

rules of procedure governing the issuance of cease and desist orders against the associations of producers of aquatic products that the Secretary of the Interior has reason to believe are monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced.

The regulations became effective January 13, 1963.

Notice of the proposed form of the new regulations was published in the Federal Register of August 31, 1962. Since no new comments, suggestions, or objections were received from interested persons, the proposed regulations were adopted without change.

The new regulations give the scope of the rules, and have provisions for institution of proceeding, complaint, notice of hearing, intervention, hearing, and preparation and issuance of final decision and order.

The new regulations implement the authority given the Secretary of the Interior under section 2 of the Fishery Cooperative Marketing Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521-522), and section 4 (e) of the 1939 Reorganization Plan (53 Stat. 1433). The Secretary of the Interior will act through the U. S. Bureau of Commercial Fisheries in carrying out his responsibilities under the Act.

The regulations as published in the December 1962 Federal Register follow:

comments, suggestions or objections with respect to the proposed new part. Suggestions were received from one fishery cooperative. The suggestions presented in the one response had been previously considered, therefore the proposed new part is hereby adopted without change as set forth below. This part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: December 14, 1962.

STEWART L. UDALL,
Secretary of the Interior.

Part 290, reading as follows, is added to 50 CFR, Subchapter I—Fishery Marketing Cooperatives:

Sec.	
290.1	Scope of rules.
290.2	Institution of proceeding.
290.3	Complaint.
290.4	Notice of hearing.
290.5	Service of documents.
290.6	Hearing official.
290.7	Intervention.
290.8	Hearing.
290.9	Preliminary decision by hearing official.

290.10 Argument before the Secretary.
290.11 Preparation and issuance of final decision and order.

AUTHORITY: §§ 290.1 to 290.11 issued under sec. 2, 48 Stat. 1213; 15 U.S.C. 522; 1939 Reorganization Plan No. II, 53 Stat. 1433.

§ 290.1 Scope of rules.

The Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521-522), the functions under which were transferred to the Secretary of the Interior by 1939 Reorganization Plan No. II, hereinafter in these rules referred to as the Act, in section 2 thereof provides a remedy whereby the associations of producers of aquatic products authorized by section 1 of the Act may be ordered by the Secretary of the Interior to cease and desist from monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof. These rules implement section 2 of the Act by establishing the procedure to be followed by the Secretary of the Interior or his authorized representative, hereinafter referred to in these rules as the Secretary, in the enforcement of the section. For

rules governing practice generally before the Department of the Interior see Part 1 of Title 43, Code of Federal Regulations.

§ 290.2 Institution of proceeding.

(a) *Application to institute proceeding.* Any person having any information that an association of producers of aquatic products is monopolizing or restraining trade may file with the Secretary an application requesting the institution of such proceeding as is authorized under the Act. The application shall be in writing, signed by or on behalf of the applicant, and shall include a concise statement of the facts constituting the alleged activities and the name and address of the applicant together with the name and address of the association against which the applicant complains.

(b) *Status of the applicant.* The person filing an application as described in paragraph (a) of this section shall have no legal status in the proceeding which may be instituted as a result of the application, except where the applicant may be permitted to intervene therein, in the manner hereinafter provided, or may be called as a witness, and the applicant's identity shall not be divulged except with the applicant's prior consent or upon court order.

(c) *Who may institute.* If, after investigation of the matter complained of in the application described in paragraph (a) of this section, or upon application of another Federal agency, or after investigation made on his own motion, the Secretary has reason to believe that any association organized under the provisions of the Act is engaging in monopolization or restraint of trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof, he will institute a proceeding. Proceedings will be instituted only upon complaint issued by the Secretary.

§ 290.3 Complaint.

(a) *Service.* The complaint shall be served upon the association by being sent by certified mail with return receipt requested to its principal place of business or by being left with a responsible person at the association's principal place of business.

(b) *Contents.* The complaint shall state in concise terms the allegations of fact which constitute a basis for the proceeding and shall require the association to show cause why an order should not be issued requiring it to cease and desist from the activities alleged therein to be in restraint of trade.

§ 290.4 Notice of hearing.

There shall also be served upon the association a notice of hearing, which shall be attached to the complaint or contained therein, and which shall specify a day and place not less than thirty days after service thereof to appear, introduce evidence, and make arguments to show cause why an order should not be made directing it to cease and desist from monopolization or restraint of trade.

§ 290.5 Service of documents.

Copies of all pleadings, briefs, memoranda, letters, and other documents filed by or on behalf of any party or which

are otherwise submitted to an official conducting any part of the proceeding for consideration in connection therewith, shall be served upon all parties or their representatives in person or by certified mail.

§ 290.6 Hearing official.

The hearing for the purpose of taking evidence and hearing arguments to determine whether an order should be issued requiring the association to cease and desist from monopolization or restraint of trade shall be conducted by a hearing official designated by the Secretary. No person shall be assigned as hearing official who (a) has any pecuniary interest in the matter or business involved in the proceeding, or (b) has participated in the investigation preceding the institution of the proceeding, in the preparation of the complaint, or in the development of the evidence to be introduced in the proceeding.

§ 290.7 Intervention.

Upon written application, interested parties shall be permitted to intervene in the proceedings when the hearing official or the Secretary shall determine that the interests of justice will be served thereby.

§ 290.8 Hearing.

(a) *Departmental counsel.* The case against the association shall be presented by a Departmental counsel appointed for that purpose. The Bureau of Commercial Fisheries shall be responsible for the case against the association and the Bureau shall be considered a party within the purview of these rules.

(b) *Conduct of hearing.* Insofar as feasible, hearings shall be informal. Parties may offer oral and written evidence, subject to the exclusion by the hearing official, in his discretion, of irrelevant, immaterial, repetitious, or hearsay evidence.

(c) *Briefs.* Briefs may be submitted on behalf of interested parties at any time prior to thirty days after the termination of the hearing.

(d) *Examination of witnesses.* Attention of witnesses shall be invited to 18 U.S.C. 1001. Testimony may be received under oath or affirmation. All witnesses may be examined or cross-examined by the hearing official and by representatives of any party.

(e) *Transcript.* The hearing official shall make provision for a complete transcript of the hearing. A copy of the transcript shall be available to interested parties upon payment of a fee prescribed by the Chief Clerk of the Department of the Interior pursuant to Part 2 of Title 43, Code of Federal Regulations, or pursuant to any applicable Departmental contract covering reporting services.

§ 290.9 Preliminary decision by hearing official.

(a) *Issuance of preliminary decision.* Following the hearing and upon completion of the time allowed for filing briefs, the hearing official shall issue a decision embodying his findings of fact and conclusions of law on all issues as to whether the association monopolizes or restrains trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced thereby. The decision

of the hearing official shall be made a part of the record and a copy thereof shall be served upon all parties to the proceeding.

(b) *Filing of exceptions.* Within thirty days after service of the decision of the hearing official any party to the proceeding may file with the hearing official exceptions to his decision. This document of exceptions shall set forth separately and specifically each error asserted.

(c) *Transmittal of record.* The hearing official, immediately following the period allowed for the filing of exceptions, shall transmit to the Secretary the entire record of the proceeding.

§ 290.10 Argument before the Secretary.

(a) *Oral argument.* Unless a party has included in the exceptions a request for oral argument before the Secretary or has filed a separate request for oral argument prior to the expiration of the last date for filing such exceptions, the right to such oral argument shall be deemed to have been waived.

(b) *Briefs.* The parties may file written briefs either in addition to oral argument or in lieu thereof.

(c) *Scope of argument.* Except where the Secretary determines that argument on additional issues would be helpful, argument, whether oral or on brief, shall be limited to the issues raised by the exceptions. If the Secretary determines that additional issues should be argued, the parties or their representatives shall be given reasonable notice of such determination, so as to permit preparation of adequate argument on all the issues argued.

§ 290.11 Preparation and issuance of final decision and order.

As soon as practicable after the receipt of the record from the hearing official, or in case further proceedings were had before the Secretary, as soon as practicable thereafter, the Secretary, upon the basis of and after due consideration of the record as a whole, including that of any proceedings before him, shall prepare a final decision and an order based upon the decision. If the Secretary has found that the association is engaged in monopolization or restraint of trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced thereby, the order shall recite the facts found by him and direct such association to cease and desist from monopolization or restraint of trade. The Secretary shall cause this order to be served upon the association. On the request of the association, or if it fails and neglects for thirty days to obey such order, the Secretary shall, in accordance with the Act, file in the district court in the judicial district in which the association has its principal place of business a certified copy of the order and of all the records in the proceeding together with a petition asking that the order be enforced and shall give notice to the Attorney General and to the association of such filing.

[F.R. Doc. 62-12495; Filed, Dec. 18, 1962; 8:46 a.m.]



Interstate Commerce Commission

FEDERAL COURT ENJOINS ENFORCEMENT OF RULING ON COOKED VEGETABLES:

By an injunction granted December 6, 1962, the Federal Court in Wilmington, Del., enjoined the Interstate Commerce Commission's enforcement of its decision that french fried potatoes and other cooked vegetables were not "frozen vegetables." Fishery shippers who are also producing and distributing french fried potatoes, onion rings, candied yams, vegetables in sauce, and similar products, may now continue to use the services of formerly exempt truckers until the U. S. Supreme Court decides the case. It has been estimated that it will be at least 6 to 12 months before a final decision can be rendered.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

TUNA CANNERY WORKERS NOT INCLUDED IN WAGE ORDER PROGRAM FOR PUERTO RICO INDUSTRIES:

A review of tuna cannery wages is not included in the wage order program under the Fair Labor Standards Act for Puerto Rico through June 1963. The program was announced on November 1, 1962, by the U. S. Labor Department's Wage and Hour and Public Contracts Divisions.

It has been determined that Industry Committee Number PR-60, which will consider wages in food and related products industries, will not cover wages in the tuna canning industry. The Committee will consider only food products industries that presently have wages from 57½ cents to \$1.09 an hour. Since tuna cannery workers in Puerto Rico are now paid a minimum rate of \$1.15 an hour, they are excluded from the current minimum wage study by the Committee.



Department of the Treasury

COAST GUARD

RENEWAL OF MOTORBOAT NUMBERS ISSUED:

Procedures designed to expedite the renewal of the Certificate of Number issued to motorboat owners by the U.S.

Coast Guard were published in the Federal Register January 5, 1963, as an amendment to 46 CFR 171.10-20, to become effective March 6, 1963. The States and areas in which the Coast Guard presently issues Certificates of Number in accordance with the Federal Boating Act of 1958 (46 U.S.C. 527-527h) are: Alaska, District of Columbia, Guam, Hawaii, Maine, New Hampshire, Pennsylvania, Tennessee, Washington, and Wyoming. The Certificate of Number issued for vessels subject to the Act is valid for a period of 3 years from the date shown thereon unless sooner revoked or cancelled.

The amended regulations state, "Numbers issued to owners of undocumented vessels pursuant to the regulations in this Part shall be renewed not later than the expiration dates shown on the Certificates of Number. The number may be renewed at any time within the 90-day period preceding the expiration date on the Certificate of Number. However, the renewal application should be received by the Coast Guard 60 days prior to the expiration date shown on the Certificate of Number. . . ."

Form CG-3876, "Application for Number," is to be used in applying for renewal of Certificates of Number. Form CG-3876 together with instructions for submitting the application will be forwarded by the Coast Guard to owners of motorboats numbered by the Coast Guard. The form will be forwarded to owners about 90 days prior to the expiration date of their current Certificate of Number. The failure of the Coast Guard to forward such an application, or the failure of the owner to receive it, does not excuse the owner from the requirement of renewing the number on or before the expiration date shown on the Certificate of Number.

Form CG-3876 is available upon request at all First Class and Second Class Post Offices throughout the United States and at all designated Third and Fourth Class Post Offices in States in which undocumented vessels must be numbered by the Coast Guard, and at all Coast Guard Marine Inspection Offices.



Eighty-Eighth Congress

(First Session)

CONGRESS CONVENES: The first session of the 88th Congress convened January 9, 1963. Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



ANADROMOUS FISH CONSERVATION: H.R. 2392 (Dingell) introduced in House Jan. 21, 1963, to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States; referred to the Committee on Merchant Marine and Fisheries. Also H.R. 3195 (Moss) introduced in House Jan. 31, 1963, referred to Committee on Merchant Marine and Fisheries.

ANTIDUMPING ACT AMENDMENT: H.R. 2575 (Dent) introduced in House Jan. 24, 1963, to amend

certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes; referred to the Committee on Ways and Means. Provides for certain changes in wording.

AQUATIC PLANTS ERADICATION: S. 250 (Beall et al) introduced in Senate Jan. 16, 1963, to provide for the control and progressive eradication of certain aquatic plants in the States of Maryland, Virginia, New Jersey, and Tennessee; referred to the Committee on Agriculture and Forestry. Concerns the Eurasian water mill-foil which occurs in fresh brackish waters in the States named. The eradication program would involve Federal-State cooperation through the Corps of Engineers. A companion bill H.R. 2994 (Morton) was introduced in House Jan. 28, 1963; referred to the Committee on Public Works.

CHEMICAL PESTICIDES COORDINATION ACT: H.R. 2857 (Dingell) introduced in House Jan. 28, 1963, to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls; referred to Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES FUND: H.R. 726 (Multer) introduced in House Jan. 10, 1963, to amend the act of Aug. 11, 1939, relating to domestically produced fishery products and to establish a fund for the advancement of commercial fisheries; referred to the Committee on Merchant Marine and Fisheries. This provides that an amount equal to 30 percent of the gross receipts collected on fishery products shall be annually apportioned by the Secretary of the Interior among those states with commercial fishing on a percentage basis. The percentage basis is determined by the ratio which the value of raw fish landed within each state for the immediately preceding year plus the value to the manufacturer of processed products within each state for the immediately preceding year bears to the total value of all raw fish landed and products processed for the most recent year within all participating states.

S. 627 (Bartlett et al) introduced in Senate Jan. 31, 1963, to promote State commercial fishery research and development projects, and for other purposes; referred to the Committee on Commerce. Authorizes the Secretary of the Interior to cooperate with the States in carrying out projects designed for research and development of commercial fishing resources and authorizes to be appropriated annually \$5 million for a total 5-year program. These funds would be apportioned among the States on a matching basis according to the extent of commercial fisheries in each State as represented by the value of raw fish harvested by domestic fishing vessels and received within each State plus the average value of the fishery products manufactured within each State. To assure that each State will receive an adequate portion, a maximum of 10 percent and a minimum of one-half of 1 percent of the funds are assured under the allocation. Each State desiring to take advantage of the benefits of the act is required to submit its plans for any proposed project to the Secretary of the Interior. The Secretary has authority to approve the plans and pay to the State the Federal share of any approved project in an amount not exceeding 75 percent of the total cost.

COMMODITY PACKAGING AND LABELING: S. 387 (Hart et al) introduced in Senate Jan. 21, 1963, to amend

the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; referred to Committee on the Judiciary. Directs the Food and Drug Administration--for foods, drugs, and cosmetics--and the Federal Trade Commission--for other consumer commodities--to promulgate regulations that will require packages accurately and clearly to give essential product information and fairly represent the contents. Identical bill, H.R. 2490 (Farbstein) introduced in House Jan. 24, 1963, referred to Committee on the Judiciary.

FISHERY MARKETING ACT AMENDMENT: H.R. 1821 (Pelly) introduced in House Jan. 14, 1963, to make clear that fishermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends; referred to the Committee on Merchant Marine and Fisheries. Would amend the Fisheries Marketing Act of 1934, an act originally designed to provide fishermen as primary producers with the right of self-association for cooperative improvement of their conditions. The amendment seeks to bring the Marketing Act up to date by relating it to the practical problems that presently cloud the rights of fishermen to associate themselves together, whether in unions or cooperatives and collectively bargain for a fair return on the fish harvested.

FISH HATCHERY (KENTUCKY): H.R. 123 (Siler) introduced in the House Jan. 9, 1963, to provide for the establishment of a new fish hatchery on or near the Cumberland River in the eastern part of the State of Kentucky; referred to the Committee on Merchant Marine and Fisheries.

FISHING VESSEL DISASTER LOANS: H.R. 2603 (Kilgore) introduced in House Jan. 24, 1963, to provide disaster loans to fishing vessel owners and operators adversely affected by failure of the fishery resource, and for other purposes; referred to Committee on Merchant Marine and Fisheries. Would authorize the Secretary of the Interior to make loans to fishing vessel owners or operators where he finds that a fishery production or resource disaster for credit that is not available from commercial banks, cooperative lending agencies, or other sources.

FISH PROTEIN CONCENTRATE: H.R. 741 (Bates) and H.R. 801 (Pike) introduced in House Jan. 10, 1963, to amend clause (3) of section 402(a) of the Federal Food, Drug, and Cosmetic Act, to provide that "no processed seafood product shall be deemed to consist of any such (filthy, putrid or decomposed) substance or to be otherwise unfit for food because such processed seafood product is derived from whole fish, provided such product is processed under sanitary conditions and after processing is nutritious and in no manner harmful to the health of consumers thereof;" referred to the Committee on Interstate and Foreign Commerce.

GAME & FOOD FISH CONSERVATION IN DAM RESERVOIRS: H.R. 2910 (Olsen) introduced in House Jan. 28, 1963, to direct the Secretary of the Interior to establish a research program in order to determine means of improving the conservation of game fish in dam reservoirs; referred to the Committee on Merchant Marine and Fisheries.

HIGHWAYS AND FISH AND WILDLIFE PROTECTION: S. 468 (Metcalfe and Moss) introduced in Senate Jan. 24,

1963, to amend title 23 of the United States Code relating to highways in order to require the approval of the Secretary of the Interior to surveys, plans, specifications, and estimates for projects on the Federal-aid highway systems for the purpose of protecting fish and wildlife and recreation resources; referred to the Committee on Public Works. A companion bill H. R. 2996 (Olsen) was introduced in House Jan. 29, 1963, referred to Committee on Public Works.

IMPORT COMPETITION ADJUSTMENT: H. R. 1139 (St. George) introduced in House Jan. 10, 1963, to provide for adjusting conditions of competition between certain domestic industries and foreign industries with respect to the level of wages and the working conditions in the production of articles imported into the United States; referred to Committee on Ways and Means.

IMPORTED COMMODITY LABELING: S. 61 (McGee) introduced in Senate Jan. 14, 1963, to amend the Federal Food, Drug, and Cosmetic Act, as amended, to require the labeling of certain imported meats, poultry, and fish; referred to the Committee on Labor and Public Welfare. Provides that imported food products or any food products processed in the United States in whole or substantial part from imported products shall be marked or labeled to indicate to purchaser that such products were not produced in the United States. Includes sales by importers, processors, packers, jobbers, distributors, dealers, retailers, or others. Companion bill H. R. 2513 (Herlong) introduced in House Jan. 24, 1963; referred to Committee on Ways and Means.

H. R. 339 (Herlong) introduced in House Jan. 9, 1963, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes. Would make three substantial changes in existing law: (1) it would be required that articles removed from a container be marked to show country of origin; (2) containers for articles for export to the United States must be marked to indicate that in the event of repackaging, such repackaging must contain the designation of the country of origin; (3) there is a penalty provision for failure to comply with these marking requirements applicable in the case of repackaging. Referred to the Committee on Ways and Means.

IMPORTS OF POLLUTED SHELLFISH PROHIBITED: H. R. 1777 (Colmer) introduced in House Jan. 14, 1963, to prohibit the importation into the United States of polluted shellfish; referred to the Committee on Ways and Means. Provides for investigations and studies in foreign countries relating to sanitary control of the shellfish industries. It would prohibit importation of shellfish from any country in which sanitary standards and practices are lower than the minimum requirements prescribed by the Public Health Service for the United States industry.

INDIAN FISHING RIGHTS: H. J. Res. 48 (Pelly), H. J. Res. 66 (Tollefson), and H. J. Res. 67 (Westland) introduced in House Jan. 10, 1963, regarding Indian fishing rights; all referred to Committee on Interior and Insular Affairs. Proposes to solve the problem of treaty or non-treaty Indians fishing off the reservation in violation of the State regulations. In furtherance of the purposes of any treaty with American Indians, the States involved are authorized to enact and to enforce laws of a regulatory nature concerning the time and manner of fishing outside an Indian reservation that are necessary

for conservation of fish, and that are equally applicable to Indians and all other citizens without distinction.

INSPECTION OF FISHERY PRODUCTS BY INTERIOR DEPARTMENT: H. R. 2031 (Morrison) introduced in House Jan. 17, 1963, to authorize the continuation of certain inspection activities of the Secretary of the Interior; referred to the Committee on Merchant Marine and Fisheries. Would authorize the Secretary of the Interior to continue inspection of food products, other than fishery products, at request of a manufacturer or processor, provided the food product was under inspection by contract for a one-year period prior to Aug. 31, 1961.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1964: H. Doc. 15, Part 1, The Budget of the United States Government, Fiscal Year Ending June 30, 1964, 440 pp., printed. Contains the Budget Message of the President and other significant data to place before the Congress the President's budgetary recommendations. Also contains the facts and figures that most users of the budget would normally need or desire.

H. Doc. 16, The Budget of the United States Government, Fiscal Year Ending June 30, 1964 (Appendix), 1195 pp., printed. Contains the text of appropriation language, schedules, narrative statements on program and performance for the individual appropriations and funds, and supplementary schedules required by law with respect to details of personnel compensation. Included are funds for the Fish and Wildlife Service, its two bureaus--Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife--and the Commissioner's Office. The 1964 Budget estimate for the Office of the Commissioner is \$386,000 an increase of \$11,000 over the 1963 appropriation of \$375,000. For the Bureau of Commercial Fisheries, the Budget estimate is \$26,526,000 an increase of \$906,951 as compared with the 1963 appropriation of \$25,619,049. The Budget estimate of \$47,754,000 for the Bureau of Sport Fisheries and Wildlife is an increase of \$4,693,703 as compared with \$43,060,297 the 1963 appropriation.

MEDICAL CARE FOR VESSEL PERSONNEL: H. R. 2108 (Rivers) introduced in House Jan. 17, 1963, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel; referred to Committee on Interstate and Foreign Commerce. Identical bill H. R. 2669 (Hansen) introduced Jan. 24, 1963, referred to House Committee on Interstate and Foreign Commerce.

METRIC SYSTEM STUDY: H. R. 18 (Miller) introduced in House Jan. 9, 1963, to provide that the National Bureau of Standards shall conduct a program of investigations, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures; referred to Committee on Science and Astronautics.

H. R. 403 (Roosevelt) introduced in House Jan. 9, 1963, to provide that the Secretary of Commerce shall conduct a study to determine the practicability and desirability of the adoption by the United States of the metric system of weights and measures; referred to Committee on Science and Astronautics.

NATIONAL FISHERIES CENTER AND AQUARIUM: In the Senate on Jan. 31, 1963, pursuant to the provisions of section 5(a), of P. L. 87-758, Senators Kirwan (Ohio) and Jensen (Iowa) were appointed as members

of the National Fisheries Center and Aquarium Advisory Board.

NATURAL RESOURCES CONSERVATION POLICY: S. 57 (McGee) introduced in Senate Jan. 14, 1963, declares a national policy on conservation, development, and utilization of natural resources; referred to Committee on Interior and Insular Affairs.

OCEANOGRAPHIC RESEARCH PROGRAM: H. R. 13 (Bonner) introduced in House Jan. 9, 1963, to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. Also introduced in the House Jan. 10, 1963: H. R. 822 (Thompson), H. R. 880 (Dingell), H. R. 895 (Keith) and H. R. 1001 (Lennon) and H. R. 3119 (Tollefson) introduced Jan. 31, 1963; all were referred to Committee on Merchant Marine and Fisheries.

OCEANOGRAPHIC RESEARCH VESSELS: H. R. 2149 (Morrison) to require that title to certain vessels supplied directly or indirectly by the United States for oceanographic research shall remain in the United States, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

OUTDOOR RECREATION BUREAU: S. 20 (Anderson et al) introduced in Senate Jan. 14, 1963, to promote the coordination and development of the effective Federal and State programs relating to outdoor recreation, and for other purposes; referred to Committee on Interior and Insular Affairs. Authorities and responsibilities given the Secretary of the Interior through the bill would include maintenance of an inventory of outdoor recreation facilities, establishment of a classification system, provision for technical assistance, encouragement of regional cooperation by the States and developing facilities, conducting research, cooperating with educational institutions in developing personnel and disseminating recreation knowledge, and promoting coordination of Federal activities in outdoor recreation. Companion bills H. R. 1762 (Aspinall) and H. R. 1763 (Saylor) were introduced in House Jan. 14, 1963; referred to Committee on Interior and Insular Affairs.

POWER PROJECTS AND MIGRATORY FISH CONSERVATION: H. R. 2391 (Dingell) introduced in House Jan. 21, 1963, to promote the conservation of migratory fish and game by requiring certain approval by the Secretary of the Interior of licenses issued under the Federal Power Act; referred to the Committee on Interstate and Foreign Commerce.

PRICE-QUALITY STABILIZATION: H. R. 457 (Cederberg) introduced in House Jan. 9, 1963, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to Committee on Interstate and Foreign Commerce. Identical bill H. R. 2564 (Dent) introduced in House Jan. 24, 1963, referred to Committee on Interstate and Foreign Commerce.

SALMON DEVELOPMENT PROGRAM IN CALIFORNIA: H. R. 94 (Holland) introduced in House Jan. 9, 1963, to direct the Secretary of the Interior to initiate a salmon and steelhead development program in California; referred to the Committee on Merchant Marine

and Fisheries. Would authorize an anadromous fish development program in California. Existing facilities of the Bureau of Sport Fisheries and Wildlife of the Fish and Wildlife Service and those of the California Department of Fish and Game shall be utilized to the fullest extent.

SALMON IMPORT RESTRICTIONS: H. R. 105 (Pelly) introduced in House Jan. 9, 1963, to facilitate the application and operation of the Fish and Wildlife Act of 1956 and for other purposes; referred to the Committee on Merchant Marine and Fisheries. Would make it unlawful to import salmon taken by any country that allows high-seas net fishing for salmon without proper conservation measures. Companion bill S. 471 (Magnuson) introduced in Senate Jan. 24, 1963; referred to Committee on Commerce.

SALMON RIVER ANADROMOUS FISH: H. R. 2920 (Westland) introduced in House Jan. 28, 1963, to provide for the conservation of anadromous fish and spawning areas in the Salmon River, Idaho; referred to Committee on Interstate and Foreign Commerce.

SHRIMP IMPORTS: H. R. 822 (Thompson) introduced in House Jan. 10, 1963, to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimps and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota, and to impose a duty on processed shrimp and prohibit its importation in excess of the applicable quota; referred to the Committee on Ways and Means.

H. R. 1774 (Colmer) introduced in House Jan. 14, 1963, to provide for an ad valorem duty on the importation of shrimp; referred to the Committee on Ways and Means.

SEAMEN'S PHYSICAL REQUIREMENTS: H. R. 77 (Bonner) introduced in House Jan. 9, 1963, to encourage and promote safety in the merchant marine by requiring that seamen on vessels of the United States meet certain physical requirements. Bill would cover many fishermen on vessels of 5 net tons and over. The Secretary of the Treasury, acting through the Commandant of the Coast Guard would establish physical qualifications for all positions on vessels of the United States. Those fishermen who are "employed on board in the care, preservation, or navigation of any vessel of the United States" would apparently be included.

SMITHSONIAN INSTITUTE & MARINE & AQUATIC BIOLOGICAL RESEARCH: H. R. 2653 (Cannon) introduced in House Jan. 24, 1963, to authorize expanded programs of research in marine natural history by the Smithsonian Institution, and for other purposes; referred to the Committee on House Administration.

STERN RAMP TRAWLERS: H. R. 1025 (Bates) introduced in House Jan. 10, 1963, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for research, and for other purposes; referred to Committee on Merchant Marine and Fisheries. Also H. R. 1603 (Glenn) introduced in House Jan. 14, 1963; referred to Committee on Merchant Marine and Fisheries.

H. J. Res. 194 (Westland) introduced in House Jan. 24, 1963, to authorize the Secretary of Commerce to construct a modern stern ramp trawler to be used for research purposes and authorizing the appropriation of funds; referred to the Committee on Merchant Marine and Fisheries.

SUBMERGED LANDS ACT: H. R. 116 (Roberts) and H. R. 360 (Huddleston) introduced in House Jan. 9, 1963, to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana, as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources, within said boundaries; both referred to the Committee on the Judiciary. Also introduced in House Jan. 10, 1963, H. R. 937 (Seldon) and H. R. 1031 (Boggs), Jan. 14, 1963, H. R. 1772 (Colmer); Jan. 17, 1963 H. R. 2153 (Morrison); all referred to Committee on the Judiciary.

TRADE EXPANSION ACT AMENDMENT: H. R. 2912 (Reuss) and S. 541 (Douglas) introduced in the House and the Senate Jan. 28, 1963, to amend the Trade Expansion Act of 1962 to extend the provisions applicable in respect to the European Economic Community to the European Free Trade Association, and to require that each category of articles designated under section 211 of such act be identifiable by not less than four digits; referred to the Senate Committee on Finance and the House Committee on Ways and Means. Would allow the dominant supplier clause of the act to apply to the United States and the Common Market and any nation of the European Free Trade Association so designated by the President. Allows the dominant supplier clause to be applied not only to the European Six, but also to Great Britain and to any of the other countries of EFTA which are designated by the President.

S. 602 (Javits) introduced in Senate Jan. 30, 1963, to authorize the President, in carrying out trade agreements with fully developed countries or areas, to reduce duties below the limitation set forth in section 201 (b)(1) of the Trade Expansion Act of 1962, and for other purposes; referred to the Committee on Finance. Will enable the United States to offer "full economic partnership" to Great Britain and to the Commonwealth countries.

WATER POLLUTION CONTROL ADMINISTRATION: S. 649 (Muskie and Humphrey), H. R. 3166 (Blatnik) and H. R. 3167 (Dingell) were introduced in the House and the Senate on Jan. 31, 1963, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes; referred to the Senate and House Committee on Public Works.

VESSEL COLLISION LIABILITY: H. R. 1070 (Garmatz) introduced in House Jan. 10, 1963, to unify apportionment of liability in cases of collision between vessels and related casualties; referred to Committee on Merchant Marine and Fisheries. Companion bill S. 555 (Bartlett) introduced in Senate Jan. 28, 1963, referred to the Committee on Commerce.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: H. R. 1026 (Bates) introduced in House Jan. 10, 1963, to amend the act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. Would amend the law which provides a construction differential subsidy for fishing vessels by extending the life of the program from June 12, 1963 to June 30, 1972; by increasing the amount of the subsidy from a maximum of one third to a maximum of one-half of the construction costs; and by broadening the scope of the law to permit participation by fisheries not eligible under the present law. Also H. R. 1604 (Glenn) introduced Jan. 14, 1963, H. R. 2172 (Tollefson) introduced Jan. 17, 1963, and H. R. 2643 (Tollefson) introduced Jan. 24, 1963; all referred to House Committee on Merchant Marine and Fisheries.

VESSEL MEASUREMENT: H. R. 81 (Bonner) introduced in House Jan. 9, 1963, to simplify the admeasurement of small vessels. Would substitute for present complicated method of tonnage measurement a new system which would permit the assignment of tonnages from a table on the basis of length and breadth only. Tonnage would be limited to self-propelled vessels of less than 500 gross tons and nonself-propelled vessels of not more than 997 gross tons. Referred to Committee on Merchant Marine and Fisheries.

VESSEL OPERATORS LICENSES: H. R. 1055 (Chamberlin) introduced in House Jan. 9, 1963, to provide for the licensing of operators of vessels numbered under the provisions of the Federal Boating Act of 1958. Fishing vessels are not specifically mentioned but the terms of the proposal would require licensed operators for fishing vessels which are undocumented and propelled by machinery of more than 10 horsepower. Referred to Committee on Merchant Marine and Fisheries.

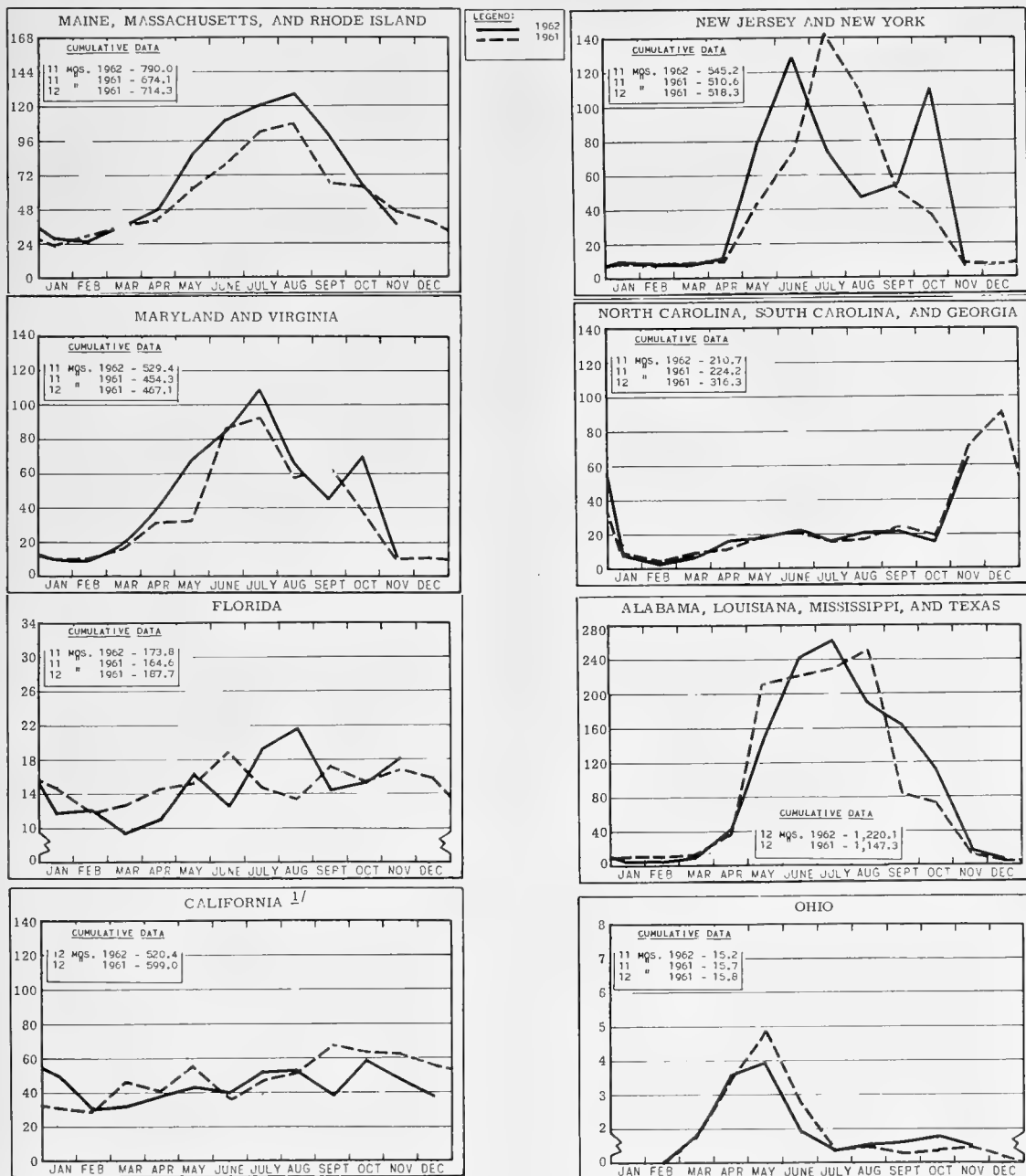
VESSEL OWNERS LIABILITY: H. R. 1069 (Garmatz) introduced in House Jan. 10, 1963, to limit the liability of shipowners, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. A companion bill S. 556 (Bartlett) was introduced in Senate Jan. 28, 1963; referred to the Committee on Commerce.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

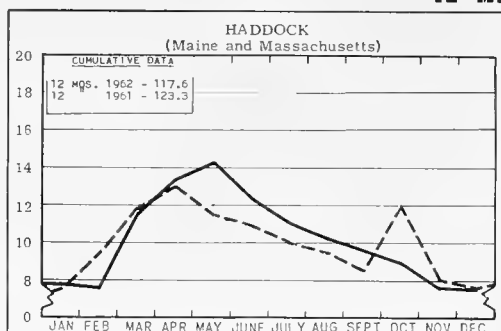
In Millions of Pounds



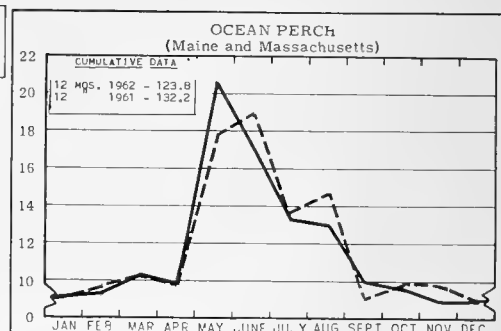
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

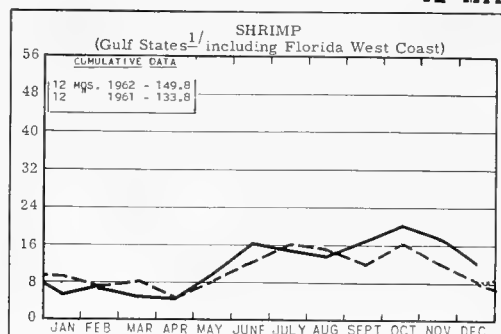
In Millions of Pounds



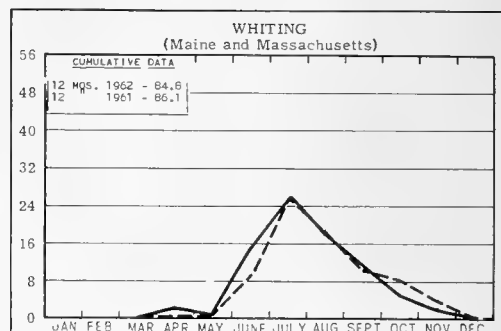
LEGEND:
— 1962
--- 1961



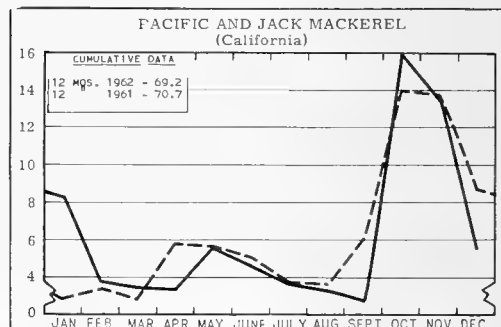
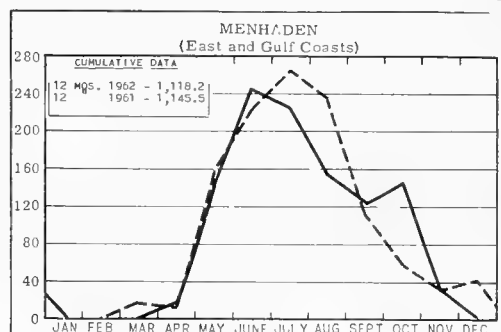
In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.



In Thousands of Tons



In Thousands of Tons

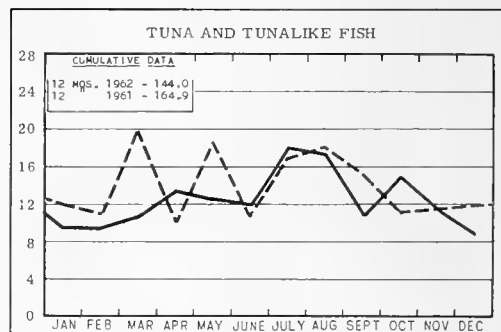
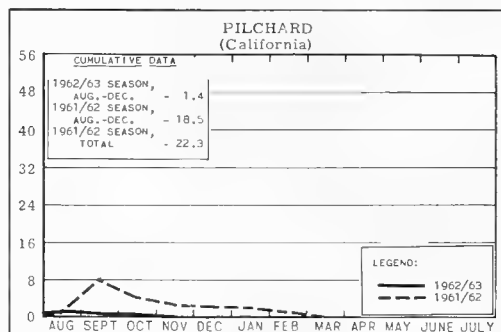
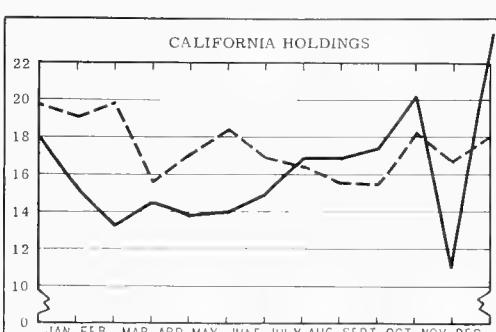
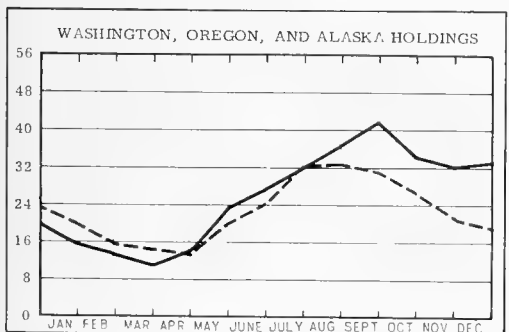
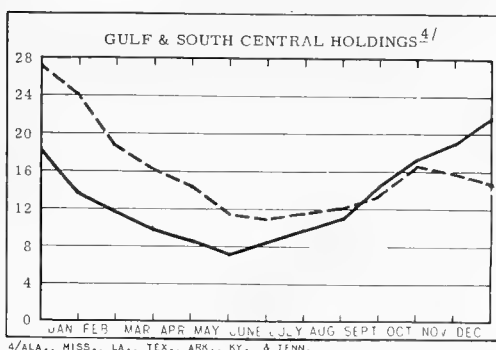
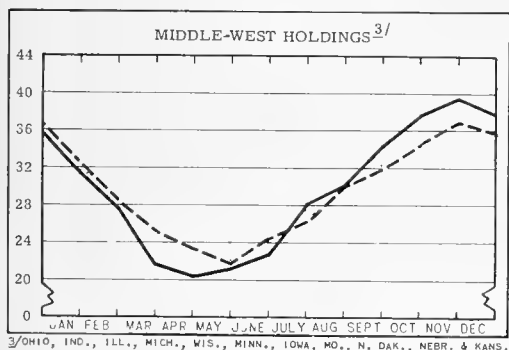
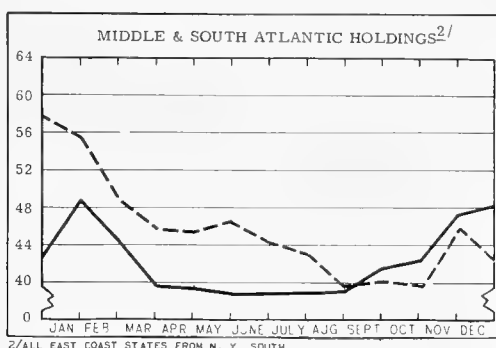
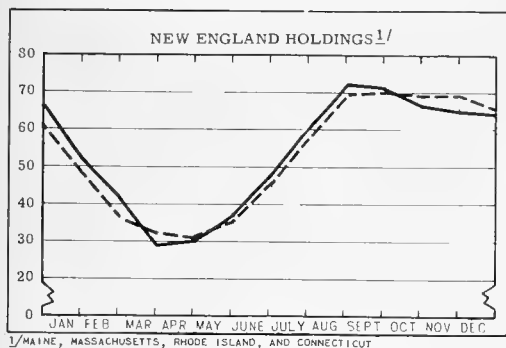
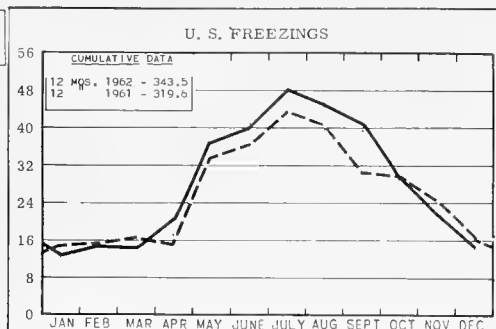
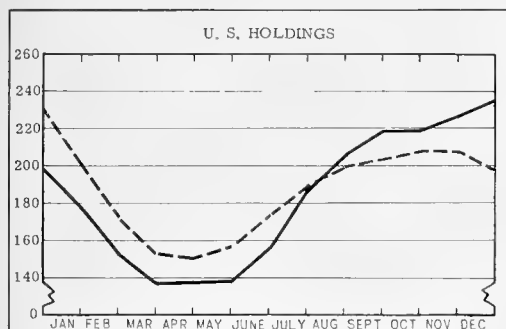


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

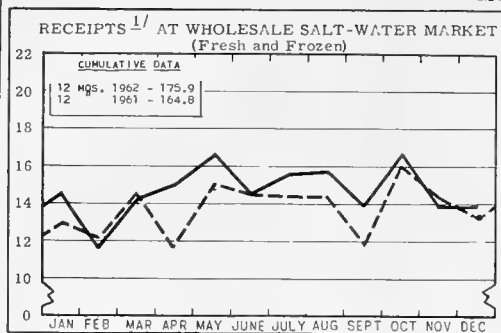
In Millions of Pounds



* Excludes salted, cured, and smoked products.

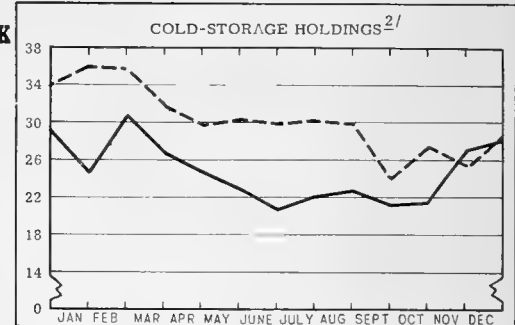
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

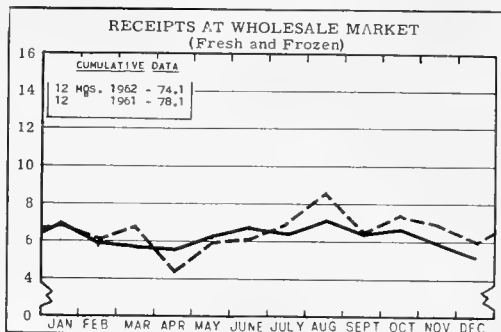


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

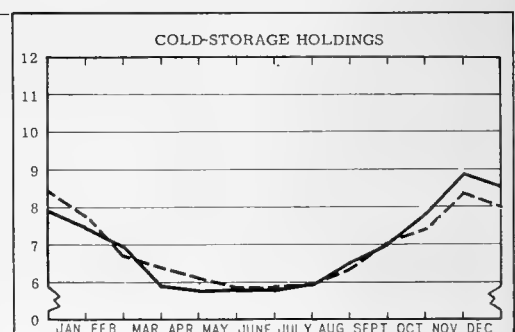
NEW YORK CITY



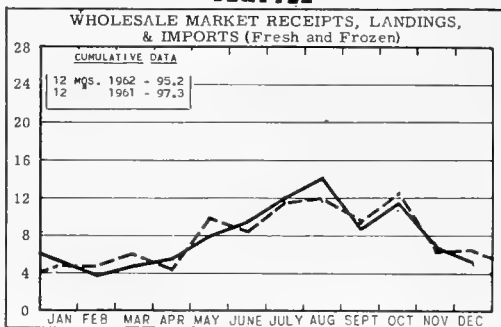
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



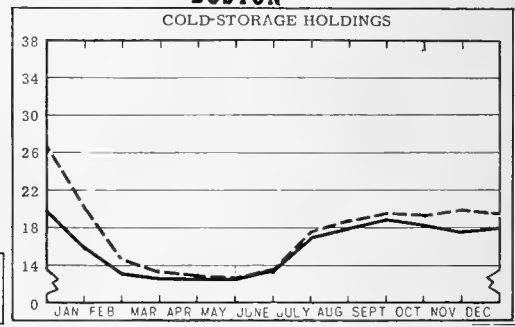
CHICAGO



SEATTLE



BOSTON



LEGEND:
— 1962
--- 1961

CHART 5 - FISH MEAL and OIL PRODUCTION

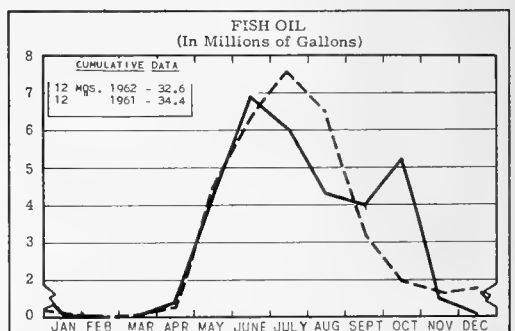
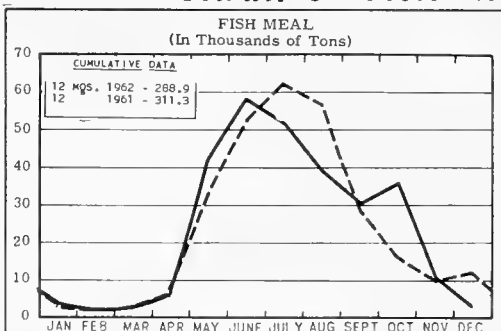
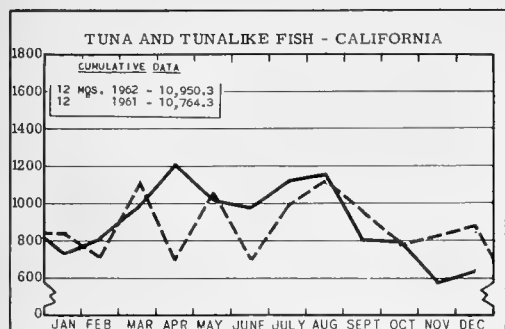
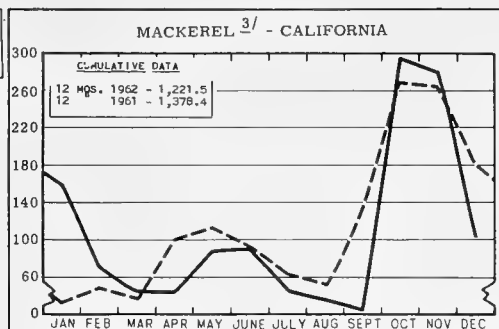


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

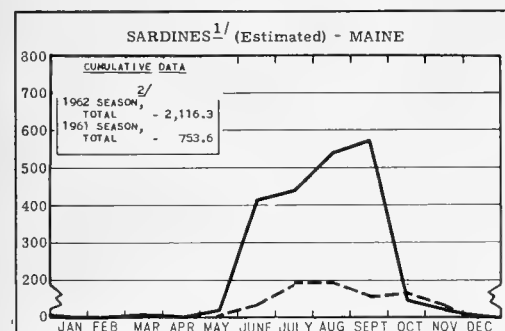
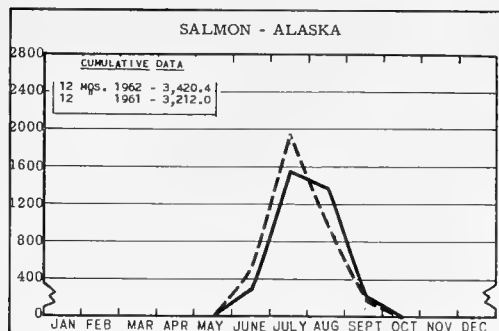
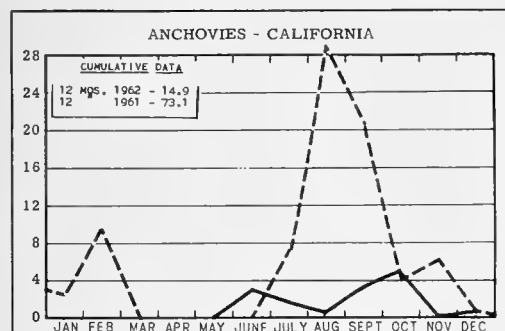
In Thousands of Standard Cases



LEGEND:
— 1962
--- 1961



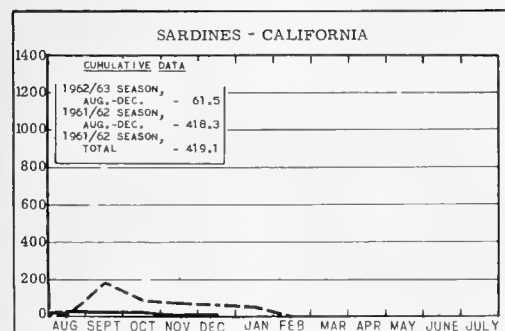
^{3/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	$3\frac{3}{4}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:
— 1962/63
--- 1961/62

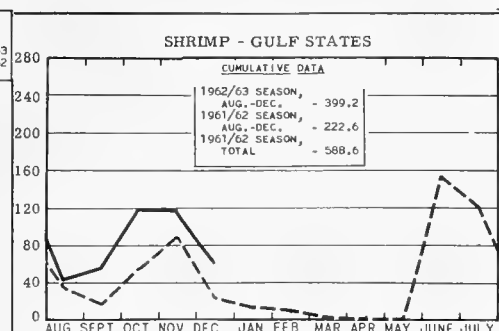
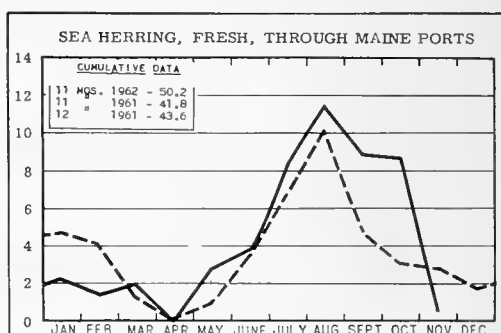
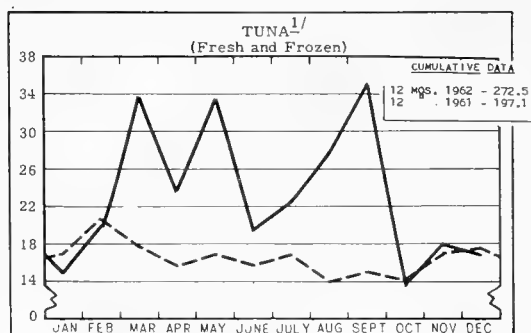
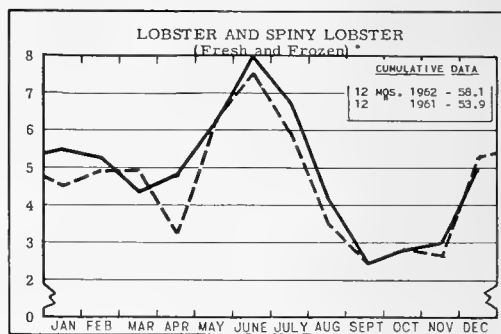
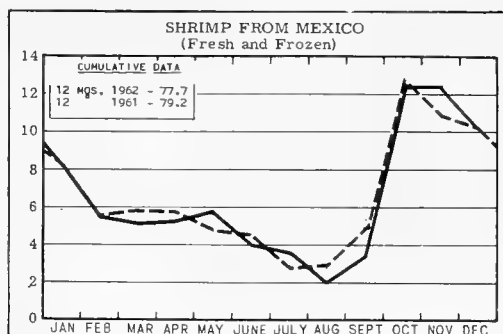
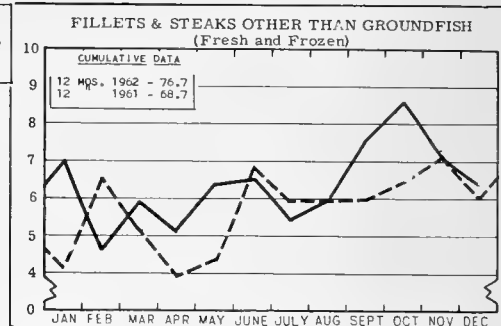
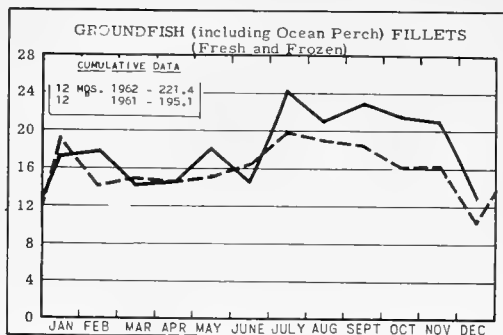
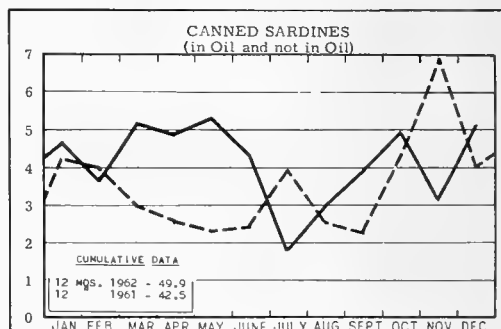
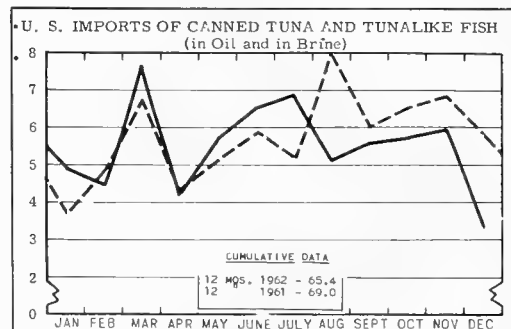


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR.-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-2862	- Canned Fishery Products, 1961 Annual Summary (Revised), 16 pp.
CFS-2863	- Industrial Fishery Products, 1961 Annual Summary (Revised), 9 pp.
CFS-3005	- Oregon Landings, 1961 Annual Summary, 2 pp.
CFS-3006	- Washington Landings, 1961 Annual Summary, 2 pp.
CFS-3010	- New England Fisheries, 1961 Annual Summary, 10 pp.
CFS-3020	- Frozen Fish Report, October 1962, 8 pp.
CFS-3028	- Louisiana Landings, July 1962, 2 pp.
CFS-3029	- Texas Landings, July 1962, 3 pp.
CFS-3030	- Texas Landings, August 1962, 3 pp.
CFS-3034	- New Jersey Landings, September 1962, 4 pp.
CFS-3035	- Georgia Landings, September 1962, 2 pp.
CFS-3037	- North Carolina Landings, September 1962, 3 pp.
CFS-3040	- Fish Meal and Oil, September 1962, 2 pp.
CFS-3041	- Louisiana Landings, August 1962, 2 pp.
CFS-3042	- South Carolina Landings, September 1962, 2 pp.
CFS-3043	- Chesapeake Fisheries, 1961 Annual Summary, 8 pp.
CFS-3045	- California Landings, August 1962, 4 pp.
CFS-3046	- Mississippi Landings, September 1962, 3 pp.
CFS-3047	- Rhode Island Landings, September 1962, 3 pp.
CFS-3048	- Wisconsin Landings, September 1962, 2 pp.
CFS-3049	- Virginia Landings, September 1962, 4 pp.
CFS-3050	- Louisiana Landings, September 1962, 2 pp.
CFS-3053	- New York Landings, September 1962, 4 pp.
CFS-3057	- Maine Landings, September 1962, 4 pp.
CFS-3058	- Maryland Landings, October 1962, 3 pp.
CFS-3059	- Fish Meal and Oil, October 1962, 2 pp.
CFS-3063	- Florida Landings, October 1962, 8 pp.

FL-91 - Turtles in the Home Aquarium, 2 pp., May 1962 (Revised).

FL-539 - List of Circulars of the U. S. Fish and Wildlife Service, by Lola T. Dees, 11 pp., May 1962.

FL-542 - Fisheries Loans for Vessels, Gear, and Research--Policies, Applications, Repayments, 9 pp., printed, August 1962. The Fisheries Loan Fund, established by the Fish and Wildlife Act of 1956, authorizes the Secretary of the Interior to approve loans to owners of fishing vessels and fishing gear, and to persons doing research into basic problems of the fisheries. It is a revolving fund which must be returned to the U. S. Treasury on June 30, 1965. This leaflet discusses loan purposes, credit requirements, eligibility, loan terms, collateral, and loan applications. It also covers processing applications, compensation for services, loan closing, repayment of loan, and insurance requirements.

Sep. No. 664 - Shellfish Hatcheries and Their Future.

Sep. No. 665 - Modifications of Chesapeake Bay Commercial Crab Pot.

Sep. No. 666 - Fish Consumption by Food Stamp and Related Low-Income Families.

SSR.-Fish. No. 427 - Whirling Disease of Trouts Caused by *Myxosoma cerebralis* in the United States, by Glenn L. Hoffman, Clarence E. Dunbar, and Arthur Bradford, 17 pp., illus., June 1962.

Effects of Pesticides on Fish and Wildlife: A Review of Investigations during 1960, Circular 143, 57 pp., processed, 1962.

List of Research Reports (Bureau of Sport Fisheries and Wildlife), 5 pp., August 1962.

List of Special Scientific Reports--Wildlife (Bureau of Sport Fisheries and Wildlife), 5 pp., August 1962.

The 1960 Salt-Water Angling Survey, by John R. Clark, Circular 153, 40 pp., 1962. An opportunity to obtain estimates of the sport catch of salt-water fish for the whole country was provided by the 1960 National Survey of Fishing and Hunting, conducted by the Bureau of the Census for the Bureau of Sport Fisheries and Wildlife. This survey had as its purpose a determination of the economic significance of both sport fishing and hunting. A plan for estimating angler's catches was included by special arrangements with the Bureau of the Census. The information resulting from the supplementary salt-water survey is the subject of this report.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON 5, D. C.

Number	Title
MNL-13	- Indian Fishing Industry, 1961, 23 pp.
MNL-62	- Centolla Industry in Tierra del Fuego (Argentina-Chile), 33 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, October 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1962, 9 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures for the month indicated.

Halibut and Troll Salmon Landings and Ex-Vessel Prices for Seattle, Alaska Ports and British Columbia, 1962-61, 35 pp., December 1962. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., Seattle 4, Wash.) Gives landings and ex-vessel prices of troll salmon and halibut at leading United States ports of the Pacific Coast; ex-vessel halibut prices and landings at leading British Columbia ports; United States and Canadian Pacific Coast halibut landings, 1936-1962; Seattle season averages of ex-vessel halibut prices, 1952-1962; and troll salmon landings and receipts at Seattle and Alaska ports, with comparative data.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, lower Northern Neck and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, October 1962, 23 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices by species for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic

Avenue fishery landings and ex-vessel prices by type of gear; for the month indicated.

New England Whiting Fishery, and Marketing of Whiting Products, 1946-61, by John J. O'Brien, 41 pp., illus., December 1962. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Summarizes all the pertinent data scattered through many Market News Service reports and other publications for a period of years on the whiting fishery of New England. Included is a brief analysis of the trends in the 1946-61 period, and all the important developments that affected the New England whiting fishery and the marketing of whiting products. The introduction gives some of the history of the fishery. This report was prepared as an aid to those in the industry producing whiting and marketing whiting products and the economists, biologists, and technologists studying the whiting fishery and industry.

New York City's Wholesale Fishery Trade--Monthly Summary--October 1962, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Role of Fish in Diets for Control of Blood Cholesterol Levels, by Maurice E. Stansby, Commercial Fisheries TL 32, 6 pp., processed, February 1961. (Branch of Technology, U. S. Bureau of Commercial Fisheries, Washington 25, D. C.) The purpose of this report is to amplify on the role of fish in human diets with respect to the effect on blood cholesterol levels, and to show how increasing the consumption of fish may be beneficial. Discusses factors controlling incidence of atherosclerosis, polyunsaturated fatty acids, use of oily fish in the diet, and use of non-oily fish in the diet.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, November 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; direct shipments to local dealers from local and non-local sources; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

The Spiny Dogfish - a Review, by Albert C. Jensen, Robert L. Edwards, and George C. Matthiessen, Report No. 61-7, 42 pp., processed. (U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., 1961.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE BRANCH OF FOREIGN FISHERIES AND TRADE, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

The Development of the Sakhalin and Kurile Islands Fishing Industry, by Sh. Nadibaidze, 5 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 12, 1961, pp. 6-11.)

Exploitation of New Fisheries in the Far East, by M. Drozdov, 5 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 10, October 1961, pp. 46-50.)

Ocean Perch Fishing in the Bering Sea, 2 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 12, 1961, pp. 53-57.)

The Tasks of the Fishing Industry in 1962 for Far Eastern Fishermen, 2 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 38, no. 1, 1962, pp. 3-8.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, 2725 MONTLAKE BLVD., SEATTLE, WASH.

Air Transportation of Fish Species in Soviet Russia, by E. Loktionov, 2 pp., processed. (Translated from the Norwegian, Fiskets Gang, vol. 47, no. 44, November 2, 1961, p. 707.)

Observations of Fish-Shoals from an Aeroplane, by Shizuo Takashima and Yoshiji Ogawa, 2 pp., processed. (Translated from the Japanese, Gyoruigaku Zasshi, vol. 8, nos. 3-4, July 1961, pp. 65-68.)

Lipids of the Muscle of Tuna, THYNNUS ORIENTALIS. VII--Distribution of Lipids in Dark-Colored Muscle, Ordinary Muscle, and Several Other Tissues, by Muneo Katada, Koichi Zama, and Hisanao Igarashi, 7 pp., processed. (Translated from the Japanese, Nihon Suisan Gakkai Shi, vol. 26, no. 4, April 1960, pp. 425-429.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Atlas of the Oceanographic Climate of the Hawaiian Islands Region, by Gunter R. Seckel, Fishery Bulletin 193 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61, pp. 371-427), 61 pp., illus., printed, 40 cents, 1962.

Effect of Certain Electrical Parameters and Water Resistivities on Mortality of Fingerling Silver Salmon, by John R. Pugh, Fishery Bulletin 208 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 223-234), 16 pp., illus., printed, 15 cents, 1962.

Pompanos (TRACHINOTUS Sp.) of South Atlantic Coast of the United States, by Hugh M. Fields, Fishery Bulletin 207 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 189-222), 38 pp., illus., printed, 30 cents, 1962.

Sport Fishing--Today and Tomorrow, ORRRC Study Report 7, 137 pp., illus., printed, 65 cents, 1962. A report to the Outdoor Recreation Resources Review Commission. Following a survey conducted by the Bureau of Sport Fisheries and Wildlife, the following recommendations were made: (1) the sport fisheries should receive wider recognition as a resource of

national significance; (2) provision of recreational fishing should be recognized as one phase of water-resource management, where all compatible uses are encouraged and developed; (3) three main problems that must be given attention--(a) greater provision for public access to all types of water, (b) correction and prevention of damaging pollution and siltation in all waters, (c) improved financing; (4) the need for more facts to guide the management of fishery resources is imperative; (5) some areas of responsibility for sport fishing are not clear, especially in the marine waters; (6) strong efforts must be taken to preserve and protect natural shorelines of large rivers, lakes, ocean beaches, and estuaries from physical damage and destruction; and (7) waters affording fishing opportunities near large centers of population are one of the most critical needs of the fishing public.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADDITIVES:

"Food Additives. V--Antioxidative Effect of Sulfur-Containing Fatty Acids on Vitamin A in Fish-Liver Oil," by Masuo Akagi and Isamu Aoki (Hokkaido University, Sapporo, Japan), article, Chemical Abstracts, vol. 55, September 4, 1961, 17933f, printed. The American Chemical Society, 1155 16th St NW., Washington, D. C.

ALGAE:

"The Blue-Green Algae of the Philippines," by Gregorio T. Velasquez (University of the Philippines, Quezon City, Philippines), article, The Philippine Journal of Science, vol. 91, no. 3, September 1962, pp. 267-380, illus., printed, single copy \$2. National Institute of Science and Technology, P. O. Box 774, Manila, Philippines.

"El Comercio de Algas en Espana" (The Algae Industry in Spain), by Jose Maria Visea, article, Industrias Pesqueras, vol. 36, no. 851, October 1, 1962, p. 338, printed in Spanish, single copy 10 ptas. (about 17 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2^o, Vigo, Spain.

Investigations Regarding the Distribution of Carrageen Algae. Our Investigations Regarding the Distribution of Carrageen Algae in Nordland, by Gulbrand Lunde and Sigurd Lunde, 11 pp., printed. (Translated from the Norwegian, Fiskeridirektoratets Skrifter, Serie Havundersokelser, vol. 5, no. 5, 1938, pp. 6-19.) Technical Services Branch, Division of Oceanography, U. S. Navy Hydrographic Office, Washington 25, D. C.

"Seasonal Aspect of the Marine Algal Flora of St. Lucie Inlet and Adjacent Indian River, Florida," by Ronald C. Phillips, article, Quarterly Journal of the Florida Academy of Science, vol. 24, no. 2, 1961, pp. 135-147, illus., printed. Quarterly Journal of the Florida Academy of Science, University of Florida, Gainesville, Fla.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ANCHOVY:

"The Maturation Process in Anchovy," by F. Alm, article, *Arsredogorelse*, July 1, 1959-June 30, 1960, SIK-Rapport No. 90, pp. 43-44, printed. Svenska Institutet for Konserveringsforskning, Goteborg, Sweden, 1960.

ANTIBIOTICS:

"Influence of Tetracycline Antibiotics on the Spoilage of Herring (*C. harengus*)," by N. N. De Silva, and R. B. Hughes (Torry Research Station, Aberdeen, Scotland), article, *Journal of the Science of Food and Agriculture*, vol. 13, March 1962, pp. 161-168, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

BARENTS SEA:

Soviet Investigations on the Biology of the Cod and Other Demersal Fishes of the Barents Sea, by N. Maslov, 42 pp., printed. (Translated from the Russian, article, *Soviet Fishery Investigations in North European Seas, 1960*, pp. 185-230.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England, 1962.

BELGIUM:

Marking and Labeling Requirements of Belgium, WTIS Part 2, Operations Report No. 62-60, 2 pp., printed, 10 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on the mark-of-origin requirement; regulations for marking specific types of goods; labeling requirements for canned foodstuffs, artificial coloring of foodstuffs, all products prepared for retail sale; and other related information.

BIOCHEMISTRY:

"Enzymic Studies on the Glycolysis of Fish Muscle. II--Colorimetric Method for the Determination of Sugars in Muscles," by Fumio Nagayama and others (Tokyo University of Fisheries, Tokyo, Japan), article, *Chemical Abstracts*, vol. 55, May 15, 1961, 9546d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Simple Method of the Determination of the Glycogen Content of Marine Animals," by V. V. Srinivasan and S. Krishnaswamy (University of Madras, Madras, India), article, *Chemical Abstracts*, vol. 56, March 19, 1962, 6302i, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

BRAZIL:

Atividades do "Albocora" em 1960 (Activities of the Albacore in 1960), by Melquiades Pinto Paiva and Maria Ivone Mota, Boletim No. 4, 18 pp., illus., printed in Portuguese. Universidade do Ceara, Estacao de Biologia Marinha, Fortaleza, Brazil.

Sudene, Boletim de Estudos de Pesca, vol. 2, no. 7, July 1962, 24 pp., printed in Portuguese. Departamento de Estudos Especiais, Division de Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12º Andar, Recife, Brazil. Includes, among others, the following articles: "Sobre a biologia da lagosta Cabo-verde *Panulirus laevis* cauda

(Latreille)" (On the Biology of the Cape Verde Spiny Lobster *Panulirus laevis* cauda--Latreille), by Petronio A. Coelho; "Um metodo a experimentar no Nordeste: pescaria noturna com lampadas" (A Method of Experimenting in the Northeast: Night Fishing with Lights); "Experiencia de pesca com caiques na costa setentrional nordestina" (Experience with the Fishery with Small Boats--Experience of Long-Line Fishing Vessels Off Northwest Coast of Africa), by Melquiades Pinto Paiva; "Lagostas que ocorrem no Nordeste Brasileiro" (Spiny Lobsters Which Occur in the Brazilian Northeast), by Petronio A. Coelho; "Sobre o peso das lagostas capturadas em Pernambuco" (On the Weight of Spiny Lobsters Landed in Pernambuco); and "Equipamentos usados na pesca das lagostas na Australia" (Gear Used in Spiny Lobster Fishery in Australia).

CANADA:

The Canadian Fish Culturist, Issue 31, October 1962, 57 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Includes articles on: "Some Water Pollution Problems Connected with the Disposal of Pulp Mill Wastes," by Michael Waldichuk; "The Need and Value of Water Quality Criteria with Special Reference to Aquatic Life," by Clarence M. Tarzwell; and "The Salmon Fishery in Nova Scotia," by N. E. J. MacEachern and J. R. MacDonald.

"Investigation and Management of Atlantic Salmon and Trout (Summary of 1961-62 Reports). Part 1--The Research Program; Part 2--The Management Program," articles, *Trade News*, vol. 15, no. 2, August 1962, pp. 3-17, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Part 1 gives an account of the extensive program of investigation of Atlantic salmon and trout in Eastern Canada. It covers catch statistics, availability of adults, production of young salmon, distribution and use of salmon of Miramichi origin, environmental changes, and physiological studies of salmon. It also covers results of brook and rainbow trout investigations--character of Maritime fresh waters, basic problems and experimental approach, annual fluctuations in standing crops of brook trout in a small stream, physical alterations of stream environments to improve brook trout production and utilization, yields of brood trout from natural and artificial recruitment, estuarial stocking of brook trout, and relative value of rainbow and brook trout in utilizing the productive capacities of Maritime fresh waters. Part 2 covers hatchery and pond operations, engineering service, biological service, adult salmon transfer, effect on salmon of new oil refinery and proposed new pulp mill, salmon net mesh experiment, river reconnaissance surveys, mine wastes disposal studies, exploits river development, lake investigations, fishway construction and remedial work, Placentia water supply, and the Indian River diversion project.

CAPELIN:

"Capelin and the Capelin Fishery," by Dag Moller and Steinar Olsen article, *Fiskets Gang*, vol. 48, January 18, 1962, pp. 27-36, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Some Data on the Biology and Fishery of the Barents Sea Capelin, by Iu. Pozdiniakov, 26 pp., printed. (Translated from the Russian, Regular Features in the Concentrations and Migrations of Commercial Fishes in the Murman Coastal Zone, and Their Relation to Biological, Hydrological and Hydrochemical Processes, 1958, pp. 150-175.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

CEPHALOPODS:

Brain and Behavior in Cephalopods, by M. J. Wells, 171 pp., illus., printed, \$4.50. Stanford University Press, Stanford University, Calif.

CHESAPEAKE BAY:

Water Temperatures, Salinities, and Fishes Collected during Trawl Surveys of Chesapeake Bay and York and Pamunkey Rivers, 1956-1959, by William Henry Massmann, Special Scientific Report No. 27, 27 pp., printed. Virginia Institute of Marine Science, Gloucester Point, Va., 1962.

CHILE:

"Notas Preliminares Sobre la Fauna Marina Preabismal de Chile, con Descripcion de una Familia de Rayas, Dos Generos y Siete Especies Nuevos" (Preliminary Notes on the Deep Sea Marine Fauna of Chile, with Description of a Family of Rays, Two Generas, and Seven New Species), by Fernando de Buen, article, La Fauna Marina Preabismal de Chile, Bulletin, vol. 27, no. 3, pp. 171-201, printed in Spanish, Museo Nacional de Historia Natural, Santiago, Chile, 1959.

CHILLING OF FISH:

"Refrigeration Equipment Applied in the Mechanical Chilling of Fish During Transport," by A. W. Lantz (Fisheries Research Board of Canada), article, Progress Reports of the Biological Station and the Technological Unit No. 1, September 1959, pp. 38-40, printed. Fisheries Research Board of Canada, Biological Station, London, Ontario, Canada.

CLAMS:

Growth and Mortality Rates of the Razor Clam (SILICUA PATULA) on Clatsop Beaches, Oregon, by George Hirschhorn, Contribution No. 27, 55 pp., illus., printed. Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Oreg., June 1962. The areas most productive of the Pacific razor clam in Oregon are Clatsop Beaches, characterized by flat beach-face slope and small sand-size. They have supported commercial and sport clam fisheries for many years under regulations which provided until 1954 for a minimum size limit of 3.5 inches in commercial catches and a limit of 36 clams by recreational diggers. Neither fishery has been subject to seasonal restrictions at any time, nor to quota limitations. In this study a description of this fishery is attempted by estimating the rates of growth and mortality essential to the determination of optimum yields. Following validation of the ring method of age determination for Clatsop stocks, the seasonal variation in weight and linear growth is examined as well as variations in linear growth of clams between beaches. Mortality rates are estimated from a census on one of the smaller Clatsop Beaches in 1952 and 1953 which included the use of serially marked clams. Finally, potential yield is examined as a function of age at first capture.

"Reproducibility of the Most Probable Numbers Technique for Determining the Sanitary Quality of Clams," by Donald W. Lear (Chesapeake Biological Laboratory, Solomons, Md.), article, Applied Microbiology, vol. 10, January 1962, pp. 60-64, printed. Applied Microbiology, Williams and Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

COD:

Further Studies on Vitamins and the Reproductive Cycle of Ovaries in Cod (GADUS MORRUA), by Olaf R. Braekkan and Gjermund Bøge, Fiskeridirektorets Skrifter Serie Teknologiske undersøkelser (Reports on Technological Research Concerning Norwegian Fish Industry), vol. 4, no. 2, 14 pp., illus., printed. A/S John Griegs Boktrykkeri, Bergen, Norway, 1962.

COMPOSITION:

"Elementary Composition of the Mineral Substance in Fish, Mollusk, and Crustacean Meat," by P. V. Kizevter, article, Chemical Abstracts, vol. 55, March 20, 1961, 5799d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Inorganic Chemical Constituents in Sea Fish. IV--The Chemical Elements and Relative Quantities of Ca and P in *Katsuwonus pelamis*," by Noboru Imanishi (University of Kochi, Kochi, Japan), article, Chemical Abstracts, vol. 55, May 15, 1961, 9699f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Studies on the Chemical Composition of Muscle Tissue. I--The Muscles of the Hagfish, *Myxine glutinos*, and the Roman Eel, *Muraena helena*," by James D. Robertson (University of Glasgow, Glasgow, Scotland), article, Chemical Abstracts, vol. 55, May 29, 1961, 10727e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

CONNECTICUT:

Connecticut Boating Guide, 39 pp., illus., printed. Boating Safety Commission, Department of Agriculture and Natural Resources, Hartford, Conn. In 1961, the Connecticut General Assembly passed Public Act No. 506 concerning "The Registration of Motorboats" and Public Act No. 520 concerning "The Creation of a Boating Safety Commission and Establishing Boating Safety Regulations." According to the report, "These laws and the recent regulations promulgated by the Boating Safety Commission have been designed to be compatible with the Federal Boating laws in order that the boating public would not be subject to widely different requirements on Connecticut State or Federal waters. The growing popularity of boating and the resulting increase in water traffic make it imperative that each pleasure boat operator know and carefully observe these laws and regulations established to protect him and his neighbors using the waters of this State." The pamphlet contains the essential elements of the laws and regulations, digests of ordinances which were received and reviewed by the commission, and other helpful information for the benefit of the boat owner and operator.

DEODORIZATION:

"Deodorization of Marine Animal Oil, and Properties of the Deodorized Oil," by T. Tsuchiya and T. Tanaka,

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article, Chemical Abstracts, vol. 56, April 2, 1962, 7453g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Removal of the Fishy Odor from Whale Oil by High-Frequency Current," by T. A. Khorin (Fat-Combine, Troitsk, U. S. S. R.), article, Chemical Abstracts, vol. 55, October 2, 1961, 20461g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

DIRECTORIES:

Fisheries Year-Book and Directory, 1962, 486 pp., illus., printed in English with French summary, British-Continental Trade Press Ltd., 222 Strand, London, England. Includes articles on the British fishing industry, Icelandic fisheries and exports, the fishing industry of the Federal Republic of Germany, Soviet production and plans, United States fisheries, the fishing industry around the world, progress in fish freezing, and the problems of the fish frier. Also covers international index of fish containers, fish supply calendar, dictionary of fish names, organizations and trade associations, trade journals, preservation of fish, world fishery research, accelerated freeze-drying, byproducts plant on board ship, fishing vessel design and construction, and fishing vessels completed or on order. The directory section contains names and addresses of exporters, producers, and trawler owners; importers and wholesalers; fish canners and bottlers; manufacturers of machinery and equipment for fish processing and refrigeration; producers of packing machinery and materials; suppliers for fisheries; manufacturers of fishery byproducts; cold storage and transport operators; and classified list of advertisers.

Marine Digest Pacific Northwest Maritime Directory and World-Wide Shipping Guide, 1962, 393 pp., illus., printed, \$2. Marine Digest Publishing Company, 79 Columbia St., Seattle 4, Wash., 1962. The world-wide shipping guide of steamship services from Washington, Oregon, and British Columbia areas lists ports alphabetically in the region of the world where they are situated. Under each port are the lines that maintain a service into that port from the Pacific Northwest. In the directory, key personnel of leading companies are cross-indexed. The directory covers the Washington ports of Seattle, Tacoma, Olympia, Gray's Harbor, Willapa Harbor, Longview, Vancouver, Port Angeles, Everett, Anacortes, and Bellingham; Oregon ports of Portland, Astoria, and Coos Bay; and British Columbia ports of Vancouver, New Westminster, Victoria, Nanaimo, Alberni, Chemainus, Courtenay-Campbell River, and Vancouver Island. Also includes a marine buyers' guide which lists alphabetically a number of products and services.

DOGFISH:

"Dogfish Gelatin," by Shirley E. Geiger, Eve Roberts, and N. Tomlinson (Fisheries Research Board of Canada Technological Station, Vancouver, British Columbia), article, Journal of the Fisheries Research Board of Canada, vol. 19, March 1962, pp. 321-326, printed. Fisheries Research Board of Canada, Biological Station, London, Ontario, Canada.

DOMINICAN REPUBLIC:

Comercio Exterior de la Republica Dominicana, vol. 9, nos. 10-12, October-December and Annual Summa-

ry, 1961, 262 pp., illus., printed in Spanish. Direccion General de Estadistica y Censos, Santo Domingo, Dominican Republic, 1962. A considerable amount of data on imports and exports of fishery products is included.

EELS:

Studies on Fishes of the Family Ophidiidae, IV--Two New Dwarf Cusk-Eels (Genus OPHIDION) from the Tropical Western Atlantic, by C. Richard Robins and James E. Bohlke, Contribution No. 240, 9 pp., illus., printed. (Reprinted from Notulae Naturae, no. 325, 1959.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla., 1959.

ETHIOPIA:

Marine Fisheries in the Area of Massawa, 1954 Eth. Cal., in Figures, Fisheries Information Leaflet No. 2, 5 pp., processed. Fisheries Division, Department of Marine, Ministry of National Defense, Imperial Ethiopian Government, Massawa, Ethiopia, October 25, 1962. Covers the fishing activities along the continental coast from Ras Kassar in the North (Sudan Border) to Thio in the South, including the inshore waters, outlying islands, and the offshore fishing grounds. Presents statistical tables giving data on fishing craft, persons employed in the fisheries, fishery products landings, volume and value of exports, sales of fresh fish in Ethiopia, landings of fresh fish by fishing method, and other related data. Most data are for July 1, 1961-August 31, 1962 (1953-1954 Ethiopian Calendar).

FISH BEHAVIOR:

The Leaping Behaviour of Salmon and Trout at Falls and Obstructions, by T. A. Stuart, Freshwater and Salmon Fisheries Research 28, 46 pp., illus., printed, \$4. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1962. Laboratory and field observations and experiments conducted during this study showed that the behavior of migrating salmonids, both adult and juvenile, when faced with a barrier or obstruction, can be correlated directly with the hydraulic conditions in the river channel. The problem of the passage of migratory salmonids over artificial obstructions is discussed and experiments are described which suggest that the provision of the normal contours of a natural river channel bed would facilitate the passage of both upstream and downstream migrants by reproducing hydraulic phenomena to which they are adapted.

FISH COOKERY:

Northwest Seafood Favorites, by Inez M. Eckblad, Extension Circular 329, 10 pp., processed. Extension Service, Institute of Agricultural Sciences, Washington State University, Pullman, Wash., April 1962. Presents recipes and tips for serving Pacific Coast fish and shellfish. Includes directions for preparing salmon baked in the sand, outdoor barbecue for a crowd, fish in foil, barbecued clams or oysters, pan roast oysters, clam chowder, baked fish, and other delicacies.

FISH CULTURE:

Fish Culture in Maine, by Stanley P. Linscott and David O. Locke, 16 pp., illus., printed. Maine Department of Inland Fisheries and Game, Augusta, Me., 1962. Discusses the history of fish culture; sources of fish eggs; egg taking; incubation of fish eggs; foods

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and feeding; sanitation and diseases; and distribution of small fish. Also discusses kinds of fish raised--landlocked salmon, brook trout, lake trout, and brown trout; and warm-water fish stocking.

"Perspectives et Interets de la Rizipisciculture a Madagascar" (Prospects and Interests of the Rice-Fish Culture of Madagascar), by A. Kiener, article, Bulletin de Madagascar, vol. 12, no. 197, October 1962, pp. 883-902, illus., printed in French. M. le Directeur de l'Imprimerie nationale, Tananarive, Madagascar Republic.

FISH MANAGEMENT:

Status of Our Knowledge of Managing Stream Fish in West Virginia, by Elwood Armstrong Seaman, Publication No. 4, 23 pp., printed. Division of Fish Management, Conservation Commission of West Virginia, Charleston, W. Va., 1952.

"The Use of Electricity in Fish Management in Pennsylvania," by Jack G. Miller, article, Pennsylvania Angler, vol. 31, no. 10, October 1962, pp. 4-8, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Discusses in some detail the use of both alternating and direct current electricity to stun fish temporarily so that they may be handled by fishery biologists.

FISH MEAL:

Biological Value and Amino Acid Composition of Fish Meals, by S. G. Wiechers and Henriette Laubscher, Progress Report No. 62, 18 pp., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, C. P., South Africa Republic.

FISH OIL:

"Toxicity of Fish Oil. X--Toxicity of Rapeseed Oil Polymerized by Heating in Air," by Noboru Matsuo (Seikei University, Tokyo, Japan), article, Chemical Abstracts, vol. 55, February 6, 1961, 2825a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

FOOD AND AGRICULTURE ORGANIZATION:

Fish in Nutrition, edited by Eirik Heen and Rudolph Dreuzer, 464 pp., illus., printed, \$19. Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England, 1962. The first International Conference on Fish in Nutrition, organized by the Food and Agriculture Organization (United Nations), was held in Washington, D. C., September 19-27, 1961. It was attended by over 300 participants from 34 countries and international organizations. This book embodies the important original review papers contributed by 33 scientists distinguished in their special fields of work, supported by some 35 scientific and technical contributions (given in condensed form) presented by other writers--all with abstracts in French and Spanish. These papers are supplemented by reports of the discussions that ensued following the presentation of the papers at their respective sessions of the conference. The contents of the book are divided into five parts. Part I covers the role of fish in world nutrition and includes articles on the aquatic biomass, the world biomass of marine fishes, importance of fisheries production and utilization, role of fish in human nutrition, and role of fish for animal feeding. Part II discusses chemical components of

fish and their changes under treatment, and is dealt with in three main sections: (1) protein and general composition; (2) lipids and vitamins; and (3) the influence of processing methods. Part III covers the contribution of fish and fishery products to national diets and includes sections on: (1) proteins; (2) lipids; and (3) trace elements and their importance. Part IV discusses fish and fishery products in animal nutrition and includes papers on the nutritional value of fish and fish products for ruminants, for pigs, for poultry, and for fur-bearing animals. Part V covers demand for fish as human food and possibilities for increased consumption with emphasis on the value of fish flour and technical logical developments in connection therewith.

Indo-Pacific Fisheries Council Proceedings, 9th Session, Karachi, Pakistan, 6-23 January, 1961, Section II--Technical Papers; Section III--Symposium, 262 pp., illus., printed, \$1. IPFC Secretariat, FAO Regional Office for Asia and the Far East, Bangkok, Thailand, 1962.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of the West Indies Federation on Fishing Boats, by Kjeld Rasmussen, FAO Report No. 1409, 42 pp., illus., 1961.

Report to the Government of Cyprus on Fishery Development Possibilities, by V. Fodera, FAO Report No. 1436, 86 pp., and map, illus., 1961.

Third Report to the Government of India on the Pearl and Chank Beds in the Gulf of Manaar, by Francesco Baschieri-Salvadori, FAO Report No. 1498, 10 pp., 1962.

Supplement to Report to the Government of India on the Improvement of Fishing Techniques in Inland Reservoirs, by S. B. Gulbadamov, FAO Report No. 1499, 60 pp., illus., 1962.

Report to the Government of Syria on a Fish Culture Project, by Dietmar R. Riedel, FAO Report No. 1502, 41 pp., 1962.

FOREIGN TRADE:

"The Trade Expansion Act of 1962," by Leonard Weiss, article, The Department of State Bulletin, vol. 47, no. 1223, December 3, 1962, pp. 847-851, printed, single copy 25 cents. Bureau of Public Affairs, U. S. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

FRANCE:

Bulletin Officiel d'Information du Conseil Supérieur de la Pêche, no. 49, July-August-September 1962, 112 pp., illus., printed in French, single copy 1.5 NF (about 30 U. S. cents). Bulletin Officiel d'Information du Conseil Supérieur de la Pêche, 6, place de la Visitation, Angers, France. Includes, among others,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

these articles: "Problemes poses par la pollution des eaux" (Problems Posed by Water Pollution), by Prat and Vivier; "Traitement de la maladie infectieuse des carpes d'elevage en etang" (Treatment of the Infectious Disease of Carp Reared in Ponds); by M. A. Wurtz; and "Poissons et crustaces d'eau douce acclimates en France en eaux libres depuis le debut du Siecle" (Fresh-Water Fish and Crustaceans Introduced into Public Waters of France since the Beginning of the Century), by Paul Vivier.

FREEZE-DRYING:

Convention in Cologne on Dry Freezing: Dry Freezing of Food, by A. S. Kovacs Hamburg, ACSI 1-1430-B, ID 2198556, 6 pp., processed. (Translated from the German, Die Ernährungswirtschaft, no. 3, 1962, pp. 107-111.) Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C.

FRESH-WATER FISHERIES:

A Collection of Six Short Articles Specially Written for Freshwater Fishermen, Circular No. 3, 24 pp., printed. Fisheries Research Board of Canada, Biological Station and Technological Unit, London, Ontario, Canada, 1961.

A Collection of Three Articles Specially Written for Freshwater Fishermen, Circular No. 4, 30 pp., printed. Fisheries Research Board of Canada, Biological Station and Technological Unit, London, Ontario, Canada, 1962.

FROZEN FISH:

"Protein Denaturation in Frozen Fish. IV--Opacity Measurements on the Muscle," by R. M. Love (Torry Research Station, Aberdeen, Scotland), and "V--Development of the Cell Fragility Method for Measuring Cold-Storage Changes in the Muscle," by R. M. Love and Eleanor M. Mackay, articles, *Journal of the Science of Food and Agriculture*, vol. 13, March 1962, pp. 197-212, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

FROZEN FOODS:

"Association of Food and Drug Officials of the United States Model Frozen Food Handling Code," article, *Frosted Food Field*, vol. 35, no. 4, October 1962, pp. 50-51, 57-59, printed, single copy \$1. Frosted Food Field, Inc., Suite 51, 321 Broadway, New York 7, N.Y. The AFDOUS Code has served as the model for frozen food handling legislation in Connecticut, Illinois, and Pennsylvania and is also being used as the basis for legislation being prepared in Maryland. Defining handling practices from plant to retail outlet, the Code will serve increasingly as a reference to both public health officials and the industry itself. The Code, the complete text of which is reproduced in the article, contains definitions of terms, requirements for frozen foods, construction and layout of frozen food plants, and design and construction of frozen food processing equipment. Also included are operating practices for the commercial manufacture of frozen foods, requirements for transportation of frozen products, warehousing requirements, and instructions for handling by retail outlets.

"Distributor Sales to Volume Feeders Rise," article, *Frosted Food Field*, vol. 35, no. 4, October 1962, pp. 28, 33, printed, single copy \$1. Frosted Food Field,

Inc., Suite 51, 321 Broadway, New York 7, N.Y. Frozen food distributors sold a greater volume of product to volume feeding outlets in 1962 than at any time previously. They expect to sell them even more in the year ahead. Certain categories of frozen foods are growing in institutional sales much more rapidly than others. Sales of fish and shellfish and of frozen vegetables in particular showed more rapid increase than any others. These, as well as other facts emerge from responses of 45 frozen food distributors, chosen at random, to a recent survey. This survey was designed to spot trends in institutional distribution of frozen foods. Frozen fish and shellfish lead by far, with nine of the distributors stating that this product grouping grew more rapidly than any other, and three others stating that it showed the second sharpest growth.

"Frozen Food All-Industry Coordinating Committee Voluntary Operating Practices," article, *Frosted Food Field*, vol. 35, no. 4, October 1962, pp. 60-61, printed, single copy \$1. Frosted Food Field, Inc., Suite 51, 321 Broadway, New York 7, N.Y. These Voluntary Operating Practices, the complete text of which is reproduced in the article, were drawn up and approved by the members of the Frozen Food All-Industry Coordinating Committee. They have been designed to allow the industry to improve its handling practices without governmental intervention. Calling for increasingly stringent temperature goals, the Practices are set up so that each segment of the industry, by refusing to accept shipments above specified temperatures, in effect polices others. The practices were approved and signed by eight national frozen food industry trade groups. Included in this article are requirements of frozen foods, warehouse equipment, warehouse handling practices, and transportation equipment. Also covered are handling practices for over-the-road transportation, handling practices for route delivery, equipment for retail stores, and retail handling practices.

GEAR:

"New Otter Boards 'Akula-2'," by E. Iu. Ianson and S. A. Minovich, article, *Rybnoe Khoziaistvo*, vol. 36, 1960, pp. 25-33, printed in Russian. *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

GENERAL:

Shore and Sea Boundaries, by A. L. Shalowitz, Publication 10-1, 444 pp., illus., printed \$3.50. Coast and Geodetic Survey, U.S. Department of Commerce, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) The first of a two-volume documented treatise on the engineering and legal aspects of shore and sea boundaries, with special reference to the use and interpretation of Coast and Geodetic Survey data. Deals with the boundary problems associated with the Supreme Court decisions in the "tidelands" cases, and with the 1958 Geneva Conventions on the Law of the Sea and provides a technical and legal background for the delimitation and demarcation of water boundaries, particularly those determined by tidal definition. Subjects covered include, among others, the inland waters problem, the offshore islands problem, the tidal boundary problem, Federal-state jurisdiction under the Submerged Lands Acts, the continental shelf doctrine in the international

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law of the sea, and interpretation of the boundary provisions of the United Nations Convention on the Territorial Sea and the Contiguous Zone.

GREAT LAKES:

Exploration of Collateral Data Potentially Applicable to Great Lakes Hydrography and Fisheries, by Charles F. Powers, David L. Jones, and John C. Ayers, 159 pp., illus., printed, Great Lakes Research Institute, University of Michigan, Ann Arbor, Mich., 1958.

GULF OF MEXICO:

"New Records and Notes on Fishes from the North-Central Gulf of Mexico," by C. E. Dawson, article, Copeia, no. 2, July 20, 1962, pp. 442-444, printed, single issue \$2.50. The American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

HERRING:

"Volumetric Determination of Oxidative Stability of Salt Herring," by R. Marcuse and N. Knutsen, article, Chemical Abstracts, vol. 54, July 10, 1960, 13483e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

HONDURAS:

Establishing a Business in Honduras, by William Frohlich and Frederick J. Tower, WTIS Part 1, Economic Report No. 62-73, 16 pp., printed, 15 cents. Bureau of International Programs, U.S. Department of Commerce, Washington 25, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Covers Government policy on investment; repatriation of capital; trade factors in investment; business organization; patents, trademarks, copyrights; regulations affecting employment, and sources of Government revenue.

INDIA:

7th Annual Report of the Gujarat Fisheries Central Co-Operative Association Limited, 1961-62, 52 pp., illus., printed. The Gujarat Fisheries Central Co-Operative Association Ltd., 'Shivprasad,' 7, Hindu Colony, Opp. Sardar Patel Stadium, Navrangpura, Ahmedabad 9, India. Covers activities of the association, including expansion of fresh fish trade, better prices for fishermen, promotion of ethical trade practices, supplying of gear and equipment to fishermen, administration of Government loans and subsidies, and other related information. It also contains information on the program for 1962-63, and on the financial situation of the Association.

INTERNATIONAL COMMISSIONS:

(North Pacific Fur Seal Commission) Proceedings of the Fifth Annual Meeting, February 7-February 9, 1962, Ottawa, Canada, 36 pp., processed. Secretary, North Pacific Fur Seal Commission, U.S. Fish and Wildlife Service, Washington 25, D. C., September 1962. The North Pacific Fur Seal Commission was established in January 1958, during a meeting held in Washington, D. C. The Commission was organized pursuant to the Interim Convention on Conservation of North Pacific Fur Seals, signed in Washington, D. C., on February 9, 1957, by the Governments of Canada, Japan, the U.S.S.R., and the United States. The Convention came into force on October 14, 1957.

This report contains a summary of the proceedings of the Fifth Annual Meeting, a report of the Standing Scientific Committee, a list of participants attending the meeting, administrative report of the Secretary to the Fifth Meeting, and summaries of fur-seal investigations during 1961 and plans for fur-seal investigations during 1962.

IRELAND:

Programme of Sea Fisheries Development, 11 pp., printed, 1s. 6d. (about 20 U. S. cents). Government Publications Sale Office, G. P. O. Arcade, Dublin 1, Ireland, 1962. Outlines the intensified development program for the Irish sea fisheries in the fields of training of fishermen and skippers, Government assistance in vessel financing and construction, and construction of fishery harbors. Also covers processing of fishery products, marketing of fish, expanded functions of the Irish Sea Fisheries Board, and investigation and research projects.

IRRADIATION:

"Gamma Irradiation Installations and Research into Food Preservation by Gamma Irradiation at the Belgian Centre d'Etude de l'Energie Nucleaire," by M. De Proost (Centre d'Etude de l'Energie Nucleaire-C.E.N.--Mol, Belgium), article, Food Irradiation Quarterly International Newsletter, vol. 2, July-September 1961, pp. A2-A5, printed. Interdepartmental Committee on Radiation Preservation of Food, U. S. Department of Commerce, Washington 25, D. C.

Investigation of the Surface Pasteurization, by Means of Soft X-Rays, of Packed Samples of Fish and Meat Containing Inner Bacteria, by A. Schmidt-Lorenz and A. Berger, AEC Tr-5096, 17 pp., processed. (Translated from the German, International Journal of Applied Radiation and Isotopes, vol. 11, 1961, pp. 161-173.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"Studies on the Browning of Irradiated Fish. I--Effect of Presence of Free Sugar on the Browning of Fish Flesh," by K. Yamada and K. Amano, article, Bulletin of the Tokai Regional Fisheries Laboratory, no. 27, 1960, pp. 47-53, printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku Tokyo, Japan.

ITALY:

"Feudal Fish in Sardinia," article, The Economist, vol. 204, no. 6209, August 25, 1962, pp. 704-705, illus., printed, single copy 1s. 6d. (about 20 U. S. cents). The Economist, 22 Ryder St., St. James's, London SW1, England. Discusses the struggle of the feudal owners and the coastal fishermen for fishing rights in the lagoon at Cabras--a lake divided from the sea by a narrow strip of land cut by canals.

IVORY COAST:

"L'industrie des Peches en Cote d'Ivoire et ses perspectives d'avenir" (The Ivory Coast Fisheries Industry and Its Prospects for the Future), article, Bulletin Mensuel, no. 11, November 1962, pp. 5-11, processed in French. Chambre de Commerce de la Republique de Cote d'Ivoire, Abidjan, Ivory Coast.

KOREA REPUBLIC:

Annual Report for Fishery Products Inspection, 161 pp., illus., printed in Korean with some English transla-

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tions. Central Fisheries Inspection Station, Ministry of Agriculture and Forestry, 103 Wonnam-Dong, Chong-Ro, Seoul, Korea, 1961. Contains a general review of the inspection of fishery products in Korea, the present status and results of fishery inspection, and related subjects.

MARKETING:

"The Marketing of Quick-Frozen Fish," by A. Kiener, article, *Revue Generale du Froid*, vol. 38, January 1961, pp. 37-41, printed in French. Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

MISSISSIPPI:

The Status and Future of the Mississippi Marine Fishery Industry (Special Committee on Economic Blueprint, Mississippi Economic Council), by G. Gunter, W. J. Demoran and H. Hague, 18 pp., processed, Gulf Coast Research Laboratory, Ocean Springs, Miss., 1962.

NETHERLANDS:

Jaarcijfers over de Visserij Gedurende het Jaar 1961 (Annual Fisheries Statistics, 1961), 167 pp., illus., printed in Dutch with summaries in English, and statistical tables in both Dutch and English. Directie van de Visserijen, 's-Gravenhage, Netherlands, May 1962. Presents information on sea, inshore, and river and inland fisheries; government regulations pertaining to the fisheries; whaling; export of salted and smoked herring; fisheries research; and fishing vessels. Contains statistical tables giving data on number and tonnage of vessels, quantity and value of marine fish and shellfish landings, salted herring exports, and other related information.

NETS:

"Colour--Fishability. IV.," by G. Molin, article, *Ostkusten*, vol. 33, 1961, pp. 21-25, printed in Swedish. *Ostkusten*, Svenska Ostkustfiskarens, Centralforbund, Hudiksvall, Sweden.

Fixed and Drift Nets, by F. Baranov, 33 pp., printed. (Translated from the Russian, *Theory and Calculation of Fishing Gear*, Chap. 8, pp. 220-255.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England, 1962.

NORTHERN RHODESIA:

Game and Fisheries Annual Report for the Year 1961, 34 pp., illus., printed, 2s. 6d. (about 21 U.S. cents). The Government Printer, Lusaka, Northern Rhodesia, 1962. The section on fisheries discusses fisheries research, work in fisheries development, progress in fresh-water fisheries in the Northern and Southern areas, accomplishments in fish farming, fishery investigations, and extension work. Also included is a report by the Chief Fisheries Research Officer covering activities of the organization, and the research program.

NORWAY:

Statistisk Arbok for Norge, 1962 (Statistical Yearbook of Norway, 1962), *Norges Offisielle Statistikk XII 87*, 367 pp., printed in Norwegian and English. Statistisk Sentralbyra, Oslo, Norway, 1962. Includes, among others, a chapter on fishing, sealing, and whaling.

It presents statistical tables giving data on fishermen and fishing craft, by counties; vessels by length, type, and counties; fishing gear, by type and material; quantity and value of the fisheries; quantity and value of principal species; production of principal fishery products; landings of seals; landings of whales; and other related data. Most of the latest data are for 1960 with some for 1961.

OCEANOGRAPHY:

Conference on Oceanographic Instruments and Other Articles, by N. N. Sysoev, Trans-124, 69 pp., illus., printed. (Translated from the Russian, *Biulleten' Okeanograficheskoi Komissii pri Prezidiume Akademii Nauk SSSR*, no 4, 1960, 68 pp.) U. S. Navy Hydrographic Office, Washington, D. C., 1962.

National Oceanographic Program, Fiscal Year 1963, ICO Pamphlet No. 3, 32 pp., illus., processed, limited distribution. Interagency Committee on Oceanography, Rm. 1714, Bldg. T-3, 17th St. and Constitution Ave. NW., Washington, D. C., April 1962. Preparation of the annual National Oceanographic Program is the responsibility of the Interagency Committee on Oceanography of the Federal Council for Science and Technology, and the report is issued each spring. In preparing this plan the Committee is charged with coordinating and stimulating work in the marine sciences by all interested Federal agencies in order to meet the national goals set by the President. The Fiscal Year 1963 program represents not only a consolidation of mission-oriented agency plans, but also a cooperative blending of independent efforts toward the achievement of common goals. The program represents, within restrictions of time, money, and manpower, a plan for maximum exploitation of the sea in man's interest. The present report contains a summary of Fiscal Year 1962 program activities, outlines the National Oceanographic Program for Fiscal Year 1963, and presents budget summaries. Also included is a report on the International Indian Ocean Expedition, in which the United States participates.

Proceedings Government-Industry Oceanographic Instrumentation Symposium, 505 pp., illus., printed, \$5. Miller-Columbian Reporting Service, 931 G St. NW., Washington 1, D. C. The Government-Industry Oceanographic Instrumentation Symposium, held at Washington, D. C., August 16-17, 1961, was sponsored by the Interagency Committee on Oceanography of the Federal Council for Science and Technology. The proceedings include the 25 papers presented by administrators and scientists, answers by panel members to questions received from the floor, lists of the scientific and industrial laboratories concerned with oceanographic research and development, lists of instrumentation developments now required for oceanographic survey and research, and other miscellaneous information. According to the report, "A major requirement for the necessary growth in oceanography is the availability of reliable, precise, and easily-used instruments to record the parameters of the oceans. A great movement is now under way to introduce new devices and modern techniques into this field. The entire ocean floor, three-quarters of the earth's surface, must be mapped in topographic and geological detail. The conditions affecting the transfer of sound must be known in general principle and in specific local detail. The earth's heat budget and energy transfers from the atmosphere to the water

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must also be defined. The range of the animals and plants in the sea and the extent and nature of the environment affecting the individual species must be understood if they are to be harvested efficiently, and if the farming of the sea is to become an accomplished fact. Rock specimens, cores, deep drilling, and the strata of the ocean bottom must be plotted if we are to use the sea's mineral resources. Many of the instruments to do these tasks have been invented; many have not yet been conceived; some are still in the predevelopment stage and much refinement needs to be done to make them generally applicable. The instrument needs for the rapidly expanding National Oceanographic Program were comprehensively outlined in the two-day Symposium. Industry was invited to assume an ever-increasing responsibility in this field."

OYSTERS:

Oyster Mortality Studies in Virginia, III--Epizootiology of a Disease Caused by HAPLOSPORIDIUM COSTALE, Wood and Andrews, by Jay D. Andrews, John L. Wood, and H. Dickson Hoese, Contribution No. 115, 17 pp., illus., printed. (Reprinted from Journal of Insect Pathology, vol. 4, no. 3, September 1962, pp. 327-343.) Virginia Institute of Marine Science, Gloucester Point, Va.

"Oysters--a Delicacy from the Cradle of the Sea," by Harold F. Udell, article, The Conservationist, October-November 1962, pp. 9-11, illus., printed, single copy 50 cents. The Conservationist, Rm. 335, State Campus, Albany, N. Y. Covers the use of oysters by the ancient Romans, the history of the New York oyster fishery, anatomy and reproduction, growth and development of young oysters, and their feeding habits.

"Studies on the Application of Dehydrogenating Reaction to Evaluate the Effects of Industrial Wastes on Oysters," by Masaru Fujiya, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, October 1960, pp. 974-980, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

PERU:

"El Paiche"; Aspectos de su Historia Natural Ecológica y Aprovechamiento (Aspects of Its Natural History, Ecology, and Development), by Jorge Sanchez Romero, 48 pp., illus., printed in Spanish. Servicio de Pesquería, Ministerio de Agricultura, Lima, Peru, 1961.

La Pesca en 1961 (The Fishery in 1961), by Javier Iparraguirre Cortez, Serie de Divulgación Científica 18, 44 pp., illus., printed in Spanish. Departamento de Economía Pesquera, Ministerio de Agricultura, Lima, Peru.

PLANKTON:

Gear Data Report from Atlantic Plankton Cruises for the R/V "Pathfinder," December 1959-December 1960, by J. J. Norcross, W. H. Massmann, and E. B. Joseph, Special Scientific Report No. 19, 1 vol., printed. Virginia Fisheries Laboratory, Gloucester Point, Va.

POISONOUS SHELLFISH:

"Biochemical Studies on Paralytic Shellfish Poisons," by Edward J. Schantz (U. S. Army Chemical Corps, Fort Detrick, Md.), article, Chemical Abstracts, vol.

55, September 4, 1961, 17917i, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

POLLUTION:

Pollution-Caused Fish Kills, January-June, 1962, 4 pp., processed. Basic Data Branch, Division of Water Supply and Pollution Control, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington 25, D. C., September 1962.

PORTUGAL:

Estatística Industrial 1961 (Industrial Statistics 1961), 329 pp., printed in Portuguese and French. Instituto Nacional de Estatística, Lisbon, Portugal, October 1962. Includes a section of statistical tables on various aspects of the Portuguese fisheries.

Madrepores (White Coral), by Lucia Rossi, 13 pp., illus., printed in Portuguese. (Translated from French, Resultats Scientifiques de la Campagne du N. R. P. "Faial" dans les Eaux Cotieres du Portugal, no. 3, 1957.) Gabinete de Estudos das Pescas, Lisbon, Portugal, 1960.

QUALITY:

"Methods for Determining Freshness of Fish," by Yu. A. Puidak, article, Proceedings of the Third Scientific Conference on Infectious and Invasive Diseases of Farm Animals (5-7 March 1957), OTS 61-31213, pp. 42-44, processed, 75 cents. (Translated from the Russian, Materialy 3-i Nauchnoi konferentsii po infektsionnym i invazionnym zabollevaniyam sel'skokhozyaistvennykh zhivotnykh, Moscow, 1957.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

"Microelectrophoresis for the Estimation of Quality of Marine Fish," by H. Hutten (Municipal Veterinary Research Bureau, Nebenstelle, Cuxhaven, Germany), article, Chemical Abstracts, vol. 54, August 25, 1960, 16685i, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

SALMON:

Alaska Salmon Management, by William F. Royce, 4 pp., illus., printed. (Reprinted from Western Fisheries, July 1961.) Western Fisheries, Roy Wrigley Corporation, Publications Ltd., 1104 Hornby St., Vancouver, B. C., Canada.

Furunculosis in Kelts, by Isabel W. Smith, Freshwater and Salmon Fisheries Research 27, 12 pp., illus., printed, 6s. (about 85 U. S. cents). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1962.

Salmon Migrations in Southeastern Alaska, by Wallace H. Noerenberg, Contribution No. 14, 6 pp., illus., printed, School of Fisheries, University of Washington, Seattle, Wash., 1958.

SANITATION:

Sanitary Regulations for Fish and Fish Products, OECD Documentation in Food and Agriculture No. 51, 186 pp., printed, \$1.50. O.E.C.D. Regional Office, Suite 1223, 1346 Connecticut Ave. NW., Washington 6, D. C., 1961. A detailed study of the regulations used by OECD member governments to exercise control over health and sanitary factors in the production of fishery

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products. The OECD instituted the study by investigating the sanitary regulations for fishery products in force in the United States, Canada, and the 18 European nations in the Organization for Economic Cooperation and Development. In 1960, a special consultant was hired to conduct the study. In December 1961, experts from the member countries held a meeting to examine the consultant's draft report; to analyze the scientific, technical, and economic factors which have been responsible for the establishment of the sanitary regulations now in force in member countries; and to determine the practical measures to be taken to establish uniform standards of quality that would be accepted by them. These data presented at the meeting, including the consultant's report and the conclusions and recommendations of the expert, are included in the report.

SARDINES:

The Pilchard of South West Africa (SARDINOPS OCELLATA), Age Composition of SARDINOPS OCELLATA in the Commercial Catches of 1958 and 1959 with Reference to a Change in Rate of Growth, by O. Nawratil, Investigational Report No. 6, 31 pp., illus., printed, Secretary for South West Africa, Windhoek, South West Africa, 1962. This is a further paper in a series dealing with the general biology of the South-West African pilchard, *Sardinops ocellata*, and is a study of the age composition of fish in commercial catches made off Walvis Bay during the period 1958 and 1959. The slower rate of growth of fish of certain year classes caught in 1958 and 1959 received special attention. Samples of 6,950 and 6,550 fish were taken in 1958 and 1959, respectively, and age-determinations were done on key samples of 1,074 fish in 1958 and on 870 fish in 1959.

Prospectus--World Distribution of Sardines, World Scientific Meeting on the Biology of Sardines, Rome, September 21-28, 1959, 13 pp., processed, Food and Agriculture Organization of the United Nations, Rome, Italy.

Standardization of Biometric and Observation Methods for Clupeidae (Especially SARDINA PILCHARDUS) Used in Fisheries Biology, GFCM Studies and Reviews No. 1, 47 pp., illus., processed, General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Rome, Italy, 1957.

SEA MAMMALS:

The Netting of Sea Mammals. A Report on the Belcher Island Expedition, 1960, by I. A. McLaren and A. W. Mansfield, Circular No. 6, 13 pp., printed, Fisheries Research Board of Canada, Arctic Unit, Montreal, Canada, 1960.

SEA STAR:

A Note on the Feeding Habits of the West Indian Sea Star ORESTER RETICULATUS (Linnaeus), by Lowell P. Thomas, Contribution No. 277, 2 pp., printed. (Reprint from *Quarterly Journal of the Florida Academy of Science*, vol. 23, no. 2, 1960, pp. 167-168.) *Quarterly Journal of the Florida Academy of Sciences*, University of Florida, Gainesville, Fla.

SHRIMP:

"Estimating a Population of Shrimp by the Use of Catch per Effort and Tagging Data", by E. S. Iversen,

article, *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 12, no. 3, 1962, pp. 350-398, illus., printed, single copy \$2. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

SIERRA LEONE:

Basic Data on the Economy of Sierra Leone, by James D. Bartlett, WTIS Part 1, Economic Report No. 62-80, 12 pp., illus., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Covers general information, structure of the economy, agriculture, forestry, mining, industry, and power. Also discusses transportation, communications, finance, foreign trade, the program for economic development, marketing, and Government representation. A section of fishing covers attempts of the Government to develop inshore fishing, the consumption of fishery products, and possibilities of developing deep-sea fishing. Included are statistical tables showing quantity and value of Sierra Leone's imports and exports.

SMALL BUSINESS MANAGEMENT:

Color Can Stimulate Sales, by Ernest Dichter, Small Business Marketers Aid No. 85, 4 pp., processed, Small Business Administration, Washington 25, D. C. Color is a tool which small businessmen can use to increase sales to customers who look for taste and imagination when buying. The leaflet points out that people are unconsciously influenced by color. They are attracted by certain colors and repelled by others. The leaflet shows example of how various marketers use color in their selling. Some use color in sales tickets and wrappings, others in the store itself, and still others inject color into their direct mail advertising.

Export Trade and the Small Manufacturer, by Joseph P. McKenna and Stanley E. Boyle, Management Research Summary, 4 pp., processed, Small Business Administration, Washington 25, D. C., August 1962. Participation in export trade appears to depend primarily on the products and not on the size of the firm, according to the report. It was found that the number of firms engaged in export trade ranged from 4 percent of the smallest firms to 17 percent of those with more than 100 employees. The outstanding problem for most of the firms was lack of information about foreign markets, export procedures, and other topics.

Federal Handbook for Small Business--A Survey of Small Business Programs in the Federal Government Agencies, 108 pp., illus., processed, Small Business Administration, Washington 25, D.C., 1962. A handbook for small businessmen, comprising a survey of small business programs in the Federal Government Agencies. The publication of the handbook was sponsored jointly by the Senate Small Business Committee, the House Small Business Committee, the White House Committee on Small Business, and the Small Business Administration. Its purpose is to provide in one comprehensive volume information on all the Federal programs of interest to small business. Each agency of the Federal Government (including the Bureau of Commercial Fisheries) which has some program beneficial to small busi-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ness firms has participated in the preparation of the data for the handbook.

Pricing Decisions in Small Business, by W. Warren Haynes, Management Research Summary, 4 pp., processed, Small Business Administration, Washington 25, D. C., August 1962. Points out that it is more important to develop sound reasoning about prices than to adopt specific rules, because reasoning adjusts more readily to differing or changing circumstances. A reasoned approach to pricing involves a comparison of the effects of a price decision on total revenue, or sales receipts, and on total costs.

SOUTH AFRICA REPUBLIC:

Department of Nature Conservation, Report No. 18, 1961, 114 pp., illus., printed, Department of Nature Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, Republic of South Africa. This report covers the activities of the Department of Nature Conservation for 1961. It includes, among others, a section on the Division of Inland Fisheries which discusses the two Government hatcheries, stocking of public waters, tidal waters of rivers, production of carp, comparison of the growth rate of four species of fish, a simple and efficient air compressor for aquarium tanks, and the control of undesirable aquatic plants.

SPAIN:

"La exportacion espanola de productos pesqueros, I--Consumo Interior y Comercio Exterior" (Spanish Export of Fisheries Products, I--Domestic Consumption and Foreign Trade), by V. Paz-Andrade, article, Industrias Pesqueras, vol. 36, no. 851, October 1, 1961, pp. 336-337, printed in Spanish, single copy 10 ptas. (about 17 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-20, Vigo, Spain.

"A producao pesqueira espanhola e a exportacao de conservas de peixe em 1961" (The Spanish Fishery Production and the Export of Canned Fish in 1961), article, Conservas de Peixe, vol. 17, no. 199, October 1962, pp. 20-22, printed in Portuguese. Conservas de Peixe, 68 Reguairao dos Anjos, Lisbon, Portugal.

SPEARFISH:

Description and Relationships of the Longbill Spearfish, TETRAPTURUS BELONE, Based on Western North Atlantic Specimens, by C. Richard Robins and Donald P. De Sylva, Contribution No. 287, 31 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 10, no. 4, December 1960, pp. 383-413.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SPINY LOBSTERS:

The Western Australian Crayfishery, 1944-1961, by Keith Sheard, 107 pp., illus., printed, Keith Sheard, 19 Webster St., Nedlands, Western Australia, 1962. Discusses in detail the development of the spiny lobster (Panulirus longipes) fishery, 1944-1961; open seasons in various areas and condition of the fishery, by months; State and Commonwealth regulations; spiny lobster behavior and fishing practice; the commercial fishery in various areas, 1944-1961; the export catch; growth and age-grouping; and fishery management. Accompanying tables and figures present data

showing the development of the spiny lobster fishery from a commercial catch of 600,000 pounds in 1944/45 to 19,200 pounds in 1959/60. During that period, the number of men engaged in the fishery rose from 42 to 1,173. The value of the catch to the State increased from about £25,000 (US\$70,000) to £4,000,000 (\$11,200,000). Between 90 and 95 percent of the catch is sold as frozen tails on the United States market.

SPORTFISH:

Standard Check List of Common Names for Principal American Sport Fishes, 27 pp., printed, 8 cents. Headquarters, Outdoor Writers Association of America, 10 E. Lafayette St., Baltimore 2, Md., 1962. A list of the common and scientific names of the principal sportfish in the United States. The names of the fish are grouped under fresh-water and salt-water classifications.

SQUID:

"Respiratory and Swimming Movements in the Cephalopod Cranchia scabra," by Malcolm R. Clarke, article, Nature, vol. 196, no. 4852, October 27, 1962, pp. 351-352, illus., printed, 3s. (about 42 U. S. cents). Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

SURGEONFISH:

A New Species of Acanthurus from the Caroline Islands, with Notes on the Systematics of Other Indo-Pacific Surgeonfishes, by John Ernest Randall, Contribution No. 268, 14 pp., illus., printed. (Reprinted from Pacific Science, July 1960, pp. 266-279.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SWORDFISH:

"Svardfiskenn--havens raskinn (Swordfish--Fighter of the Sea), by Erik Hallstrom, article, Svenska Vastkust Fiskaren, vol. 32, no. 16, August 25, 1962, pp. 360-361, illus., printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Goteborg, Sweden.

TRADE LISTS:

The Bureau of International Business Operations, U. S. Department of Commerce, has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Hong Kong, 6 pp., September 1962. Lists names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm.

TRAWL FISHING:

"The Oregon Trawl Fishery for Mink Food--1948-1957," by Walter G. Jones and George Y. Harry, Jr. (Bureau of Commercial Fisheries, Ann Arbor, Michigan), article, Oregon Fish Commission Research Briefs, vol. 8, no. 1, 1961, pp. 14-30, printed. Fish Commission of Oregon, 307 State Street Office Building, 1400 SW. 5th Avenue, Portland 1, Oregon.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TROPICAL FISH:

Encyclopedia of Tropical Fishes, with Special Emphasis on Techniques of Breeding, by Herbert R. Axelrod and William Vorderwinkler, 763 pp., illus., printed. Sterling Publishing Co., Inc., 122 E. 25th St., New York 16, N. Y., 1961.

TROUT:

Some Morphological Characters of Trout from Lake Mavrovo and the River Radika, by M. Sidorovski, OTS 60-21648, 14 pp., illus., printed, 50 cents. (Translated from the Macedonian, Izdanja (Skopje), vol. 1, no. 5, 1955, pp. 135-147.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

TUNA:

"Studies on the Green Meat of Albacore and Yellowfin Tuna," by Yuichi Sasano and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, June 1961, pp. 586-592, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

"Tuna Larva," by M. Watson, article, Oceanus, vol. 9, no. 1, September 1962, p. 19, illus., printed. The Woods Hole Oceanographic Institution, Woods Hole, Mass. The larvae of the six species of tuna appear identical but have been distinguished from one another, by previous investigators, on the basis of differences in pigmentation. The present study found pigmentation such a variable characteristic that precise identification was untenable. Thus a new method was developed by using the soft x-ray technique. Medical equipment was used to photograph the vertebral characteristics of four of the five western Atlantic species of larval tuna. Now certain identification became possible for the first time.

TYRRHENIAN SEA:

"Rapport sur les recherches oceanographiques faites en Nord Tyrrhenienne en fevrier 1960" (Report on Oceanographic Research Conducted in the North Tyrrhenian in February 1960), by Jean Le Floch, article, Travaux du Centre de Recherches et d'Etudes

Oceanographiques, vol. 4, no. 4, May 1962, pp. 45-63, illus., printed in French. Centre de Recherches et d'Etudes Oceanographiques, 1, Quai Branley, Prais (7e), France.

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Mechanization of Under-the-Ice Fishing, by N. S. Ferstut and B. S. Torban, T. 129, 4 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, no. 3, 1953, pp. 21-24.) University of Melbourne, Languages Section, Faculty of Science, Parkville, N2, Victoria, Australia.

VIRGINIA:

A Revised Preliminary Check List of the Invertebrate Fauna of Marine and Brackish Waters of Virginia, by Marvin L. Wass, Special Scientific Report No. 24, 1 vol., printed. Virginia Institute of Marine Science, Gloucester Point, Va., 1961.

VITAMIN A:

"Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. XI--Esterification of Vitamin A Concentrate. 3--Divitamin A Esters of Phthalic Acids," by Toyosuke Kinumaki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, March 1961, pp. 261-281, illus., printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

WHALES:

Whales, by E. J. Slijper, 475 pp., illus., printed, 63s. (about US\$8.85). Hutchinson and Co., Ltd., 11 Stratford Pl., London W1, England, 1962.

YUGOSLAVIA:

Licensing and Exchange Controls--Yugoslavia, WTIS Part 2, Operations Report No. 62-61, 4 pp., printed, 10 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers Yugoslav import, export, and foreign exchange controls; United States import and export controls; and other related information.



Created in 1849, the Department of the Interior--America's Department of Natural Resources--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

TOPSY TURVY TUNA PIE

Lent is the time to let your table sing with seafoods. With the approach of this religious season, fresh, frozen and canned seafoods in myriad forms smile at the variety-minded consumer from shelves, freezers, and beds of freshly-crushed ice.



- | | |
|--|--|
| 1 can (6 1/2 or 7 ounces each) tuna | 2 eggs, beaten |
| 2 tablespoons chopped onion | 1/2 cup fresh bread crumbs |
| 1 tablespoon tuna oil | 6 thin slices lemon or orange |
| 1 can (10 1/2 ounces) condensed cream of mushroom soup | 1 package (12 ounces) cornbread or corn muffin mix |

Conventional cornbread bolstered nutritionally with protein-rich tuna and gayly decked with lemon or orange slices flips to gain the favor of the discriminating homemaker during the Lenten season.

Drain tuna, reserving oil. Flake tuna. Cook onion in oil until tender. Add soup, egg, bread crumbs, and tuna; mix well. Arrange lemon or orange slices on the bottom of a well-greased 10-inch pie pan. Pour tuna mixture over fruit slices. Prepare cornbread mix as directed on package. Spread batter over tuna mixture. Bake in a hot oven, 400° F., for 25 to 30 minutes or until brown. Remove from oven and let stand for 10 minutes. Loosen from sides of pan with a spatula and invert onto serving plate. Serves 6.

Versatile seafoods are rushed daily from seines to supermarkets and from harbors to households; with these quality products the imaginative consumer can let her culinary creativeness run rampant. Flexible fillets, savory steaks, palatable portions, convenient canned fish and tang-o-the-sea shellfish await her selection at nearby stores.

Not only do seafoods appear in endless shapes and sizes, but they lend themselves to countless methods of preparation. Steaks or salads, chowders or canapes, soups or sandwiches; broiled, baked, fried or flaked; breakfast, brunch, dinner or lunch--seafoods satisfy.

The New Orleans Mardi Gras which precedes the Lenten season is internationally famous for its great show of imagination. With the imagination and her own special touch, the American housewife can let the sparkle of Mardi Gras linger on her table throughout the Lenten season.

--From Fisheries Marketing Bulletin: "Let the Sparkle of Mardi Gras--Linger on Your Table Throughout the Lenten Season." Issued by the National Marketing Services Office, U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.

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Fishes

COMMERCIAL FISHERIES REVIEW



VOL. 25, NO. 3

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UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor*

G. A. Albano,** H. M. Bearse, and H. Beasley, Assistant Editors

(*On special assignment for 7 months. **Acting Editor)

Address correspondence and requests to the: Chief, Fishery Market News Service, U.S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington 5, D.C.

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5/31/63

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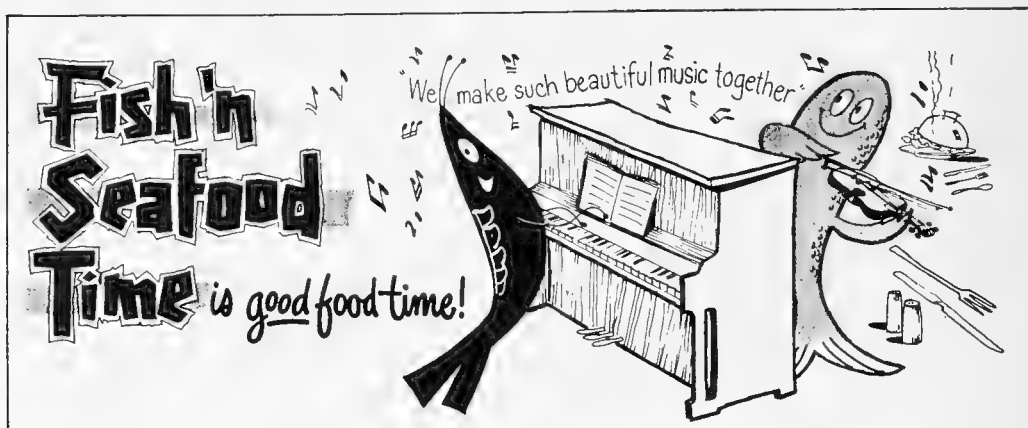
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Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

Sr. Composer: Alma Greene

Jr. Compositors: Donna K. Wallace and Marjorie McGlone

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PRESENT AND FUTURE FACTORS THAT MAY INFLUENCE FISH MEAL DEMAND

By Clarence F. Winchester*

INTRODUCTION

Our fisheries constitute one of our most important sources of high-quality animal protein concentrate. Without relatively inexpensive sources of such proteins, there is doubt that the poultry and swine industries could have attained their present levels of efficiency.

Of the factors that influence the demand for fish meal, a few that seem particularly worthy of consideration give rise to the following questions: (1) How does the potential demand compare with domestic production plus imports? (2) How does the quantity of imports compare with United States production of fish meal, and what changes have occurred in available supply during the past two decades? (3) What effects are the relatively new poultry by-product meals (including feather meal) having on the demand for fish meal, and how are both classes of products related to the byproducts of the meat-packing industry? (4) What will happen if the fish growth factors are identified and manufactured cheaply? (5) What can we do to increase the buyers' satisfaction with fish meal?

If we can find answers to those questions, we can form a good picture of the future demand for fish meal.

PRODUCTION AND IMPORTATION OF FISH MEAL COMPARED WITH POTENTIAL DEMAND

To determine the relationship between the amount of fish meal presently available in this country and the potential demand, we have assembled pertinent information from a number of sources. The total domestic production plus imports of fish meal and solubles in 1961 give the available supply of those products (table 1).

Table 1 - United States Production and Imports of Fish Meal and Solubles ^{1/} , 1961					
Product	U. S. Production		Imports		Total (Converted to 60% Protein)
	Actual	As 60% Protein	Actual	As 60% Protein	
Fish meal and scrap .	299,000	299,000	218,000	218,000	517,000
Solubles	110,000	58,000	6,700	3,600	61,600
Total					578,600

^{1/}U. S. Bureau of Commercial Fisheries, 1962.

To compare that quantity of fish meal with the amount of feed consumed by poultry and swine, we have assembled the information given in table 2 on feed intake of those animals.

*Animal Nutritionist, Technical Advisory Unit, Branch of Technology, U. S. Bureau of Commercial Fisheries, Boston, Mass.
^{1/}This paper is based upon a talk presented to the Virginia Fishermen's Association, February 13, 1962, Old Point Comfort, Va.

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Table 2 - Feed ^{1/} Consumption of Poultry and Swine				
Type of Poultry or Swine	Individuals	Feed Per Individual	Feed For Population	
	<u>Millions</u>	<u>Pounds</u>	<u>Million</u>	
			<u>Pounds</u>	<u>Tons</u>
Poultry^{2/}:				
Chickens (except broilers)	369.4	4/100	36,948	18.5
Broilers	1,730.5	5/ 9	15,574	7.8
Turkey (breeders)	3.7	4/144	527	0.3
Turkey, poults (first 8 weeks) .	81.9	6/ 9	736	0.4
Total			53,787	26.9
Swine^{2/}:				
Breeders	8.4	8/2,555	21,421	10.7
Market animals .	75.0	8/ 600	45,000	22.5
Total			66,421	33.2
Poultry plus swine, total				60.0

1/Air-dry basis.
2/Feed: per year for breeder, per individual for market poultry and swine.
3/United States Department of Agriculture, 1960.
4/National Research Council, 1960.
5/Reference No. 4, Table 7.
6/Reference No. 4, Table 8. By interpolation, small-type female and male poults weigh respectively 2.5 and 3.1 pounds and have consumed 6.3 and 7.3 pounds of feed by the end of the eighth week; large-type weigh 4.2 and 4.8 and have consumed 8.9 and 10.6 pounds of feed. By representing distribution as 15 percent small-type and 85 percent large, the present mean size of turkeys at slaughter, slightly under 18 pounds, is approximated (United States Department of Agriculture, 1962a).
7/United States Department of Agriculture, 1961.
8/National Research Council, 1959.

The amount of fish meal and solubles available in 1961 was about 579,000 tons (solubles converted to a 60-percent protein basis). This level of production, though seemingly large, is dwarfed when compared to the feed intake of poultry and swine. One percent of the total feed consumption given in table 2 is shown in figure 1 together with the present level of production of fish meal and solubles plus imports. This figure demonstrates that our production and imports are equal to only about 1 percent of the feed consumed by those animals. A 5-percent level, however, would not be excessive for any of the animals shown in table 2; actually, many broiler rations contain 10 percent of fish meal, or slightly more. The limiting factor is the oil content of the meal because a mixed feed that contains over 1 percent of fish oil can impart a flavor to poultry meat detectable by some individuals. Fish meal that contains 10 percent of oil or less can be used safely at the 10-percent level in a mixed poultry feed. Obviously, the possible consumption of fish meal and solubles is several times greater than the present domestic production plus imports.

IMPORTED FISH MEAL COMPARED WITH DOMESTIC PRODUCTION

Imports accounted for 38 percent of the fish meal and solubles consumed in the United States in 1961, whereas for the years 1960, 1959, and 1958, the percentages were 28, 27, and 25, respectively. It may be concluded that imports are increasing rapidly and that they may soon exceed domestic production. Because this short-time comparison may distort the picture, however, we have represented graphically both the United States production and imports during the past 21 years in figure 2. The figure shows that although both domestic production and imports have increased during the period in question, imports have tended to increase faster than has domestic production. Nevertheless, the increase of imports in comparison with United States production viewed over a two-decade period has not been as rapid as is suggested by the data for the past four years. Although South American production has

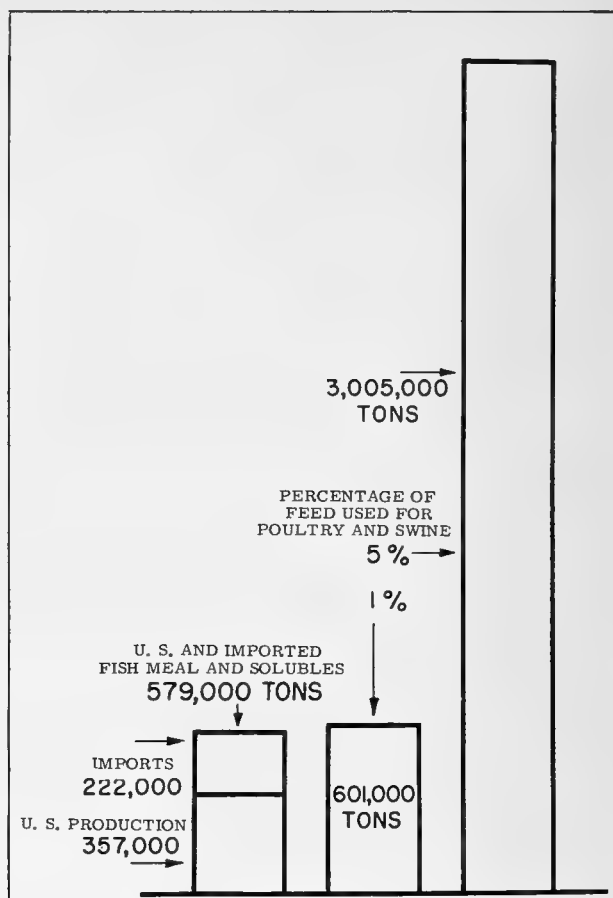


Fig. 1 - Fish meal and solubles available supply compared with possible demand. (Data are from tables 1 and 2.)

undoubtedly influenced recent imports, figure 2 shows that in 1950, and in some prior years, imports represented a considerable share of the total consumption, amounting at times to as much as 19 percent. It would be unwise to use the imports of the past four years as a basis for predicting future imports, yet at the same time we are not justified in extrapolating the data for the past one or two decades.

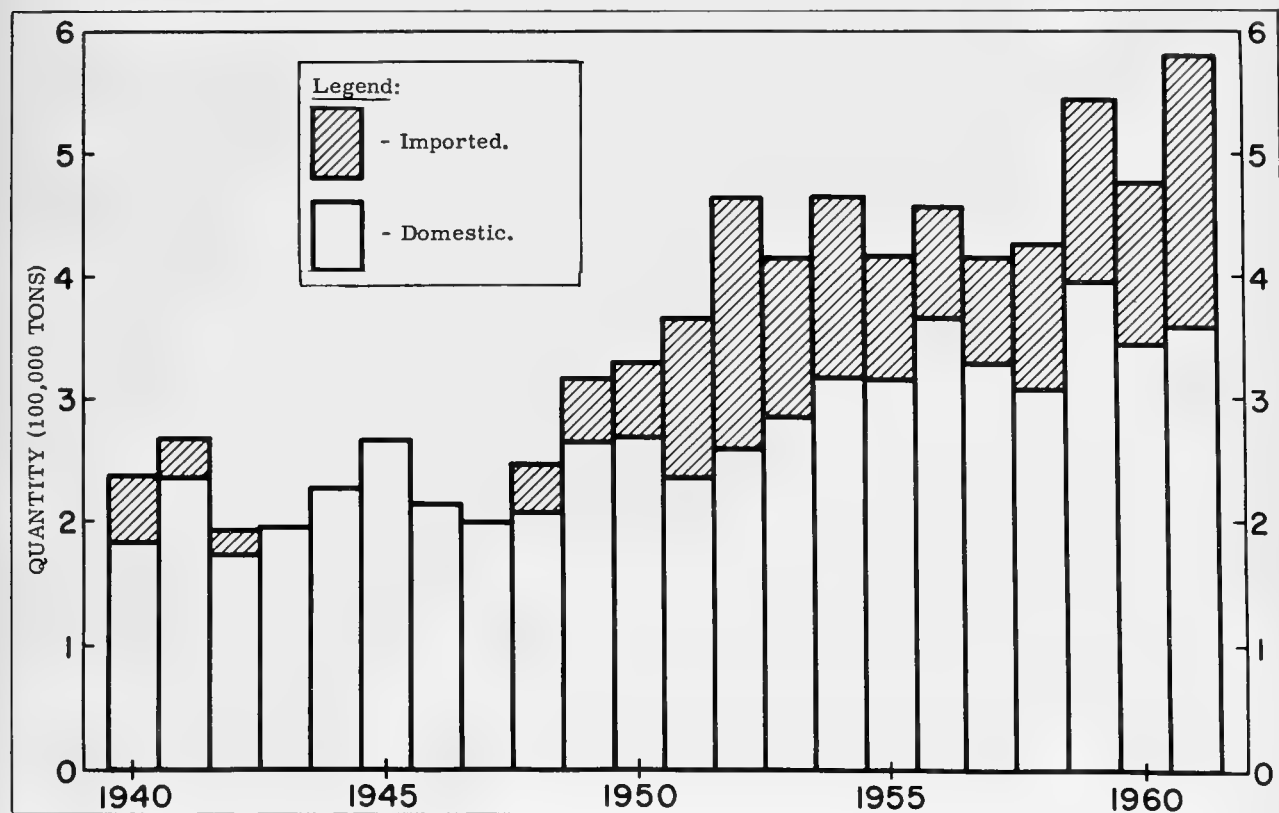


Fig. 2 - Domestic production and imported fish meal and solubles. (Tonnages of solubles converted to represent 60-percent protein. U. S. Bureau of Commercial Fisheries Statistical Digests, 1959 and earlier; and U. S. Supply of Fish Meal and Solubles, 1951-1961 and 1962.)

It appears safe to assume that United States production and imports will both continue to increase, but it is not possible to predict whether domestic production and imports will follow the trends of the past two decades, those of the past few years, or some other trend.

MEAT SCRAP AND POULTRY BYPRODUCTS IN RELATION TO FISH MEAL

The largest source of animal protein concentrate is meat scrap and tankage, by products of the meat packing industry of which roughly $1\frac{1}{2}$ million tons are sold annually. The production of those concentrates about doubled during the past 20 years. The magnitude of meat scrap and tankage production in comparison with other protein concentrates is given in table 3.

Poultry byproducts--feather meal, poultry meat scrap, and blood meal--however, have appeared on the market only within the last decade.

When feather meal first appeared, there was some question as to whether it would prove to be a suitable feed ingredient. Unprocessed feathers are, of course, practically undigestible, and many poultry producers doubted that cooking feathers about half an hour at 35-pound pressure would render them fit for use as feed. Actually, such treatment produces a concentrate that is 70 percent digestible. It has been demonstrated that feather meal protein is well utilized by chicks in proportions up to almost two-thirds of the dietary protein intake when

properly supplemented with lysine, methionine, and tryptophan--amino acids that occur in relatively limited amounts in feather meal (Davis et al 1961).

Table 3 - United States Production of Animal Protein Concentrates

Product	Protein Concentration	Production	
		Actual	Converted to 60% Protein
	Percent		(Tons)
Meat scrap and tackage ^{1/}	55	1,677,000	1,537,000
Fish meal ^{2/}	60	299,000	299,000
Solubles ^{2/}	32	110,000	58,000
Fish meal and solubles total			357,000
Poultry byproducts ^{3/} :			
Feather meal	85	105,000	149,000
Meat scrap and meal (poultry byproducts meal) . .	55	152,000	139,000
Blood meal (poultry)	80	10,000	13,000
Poultry byproducts total			301,000

1/United States Department of Agriculture, 1962b.
2/United States Bureau of Commercial Fisheries, 1962.
3/United States Department of Agriculture, 1961. Davis, J. G., et al 1961. The most recent data on proportions of total poultry waste converted to byproducts are, unfortunately, those of 1955. Poultry production data from Agriculture Department were used with data of J. S. Davis (1955 figures). Without doubt, percentages converted have risen since 1955 so that actual production of poultry byproducts exceeds the figures offered by us.

Poultry meat scrap, which is a good source both of the unidentified growth factors and vitamin B₁₂ is held in high regard by animal nutritionists, and, of course, poultry blood meal is equal to similar products from other species.

The monetary return to the poultry processor for byproducts can amount to 0.5 percent of the value of the poultry slaughtered. (Davis et al 1961). Broiler men maintain that there have been times when the return for the byproducts was their only net profit, and some of them claim that it was this small margin that kept them in business when broiler prices slumped in 1961. Thus, it was the marketing of poultry byproducts that helped preserve the broiler industry as a market for fish meal and solubles.

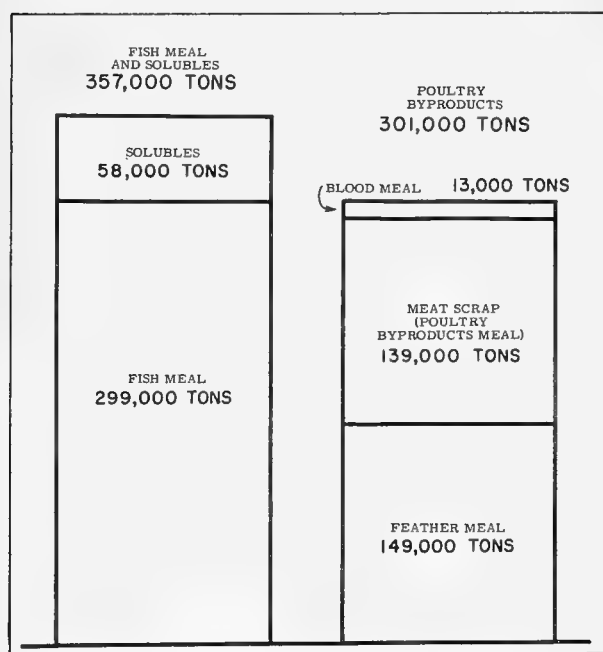


Fig. 3 - United States production of fish meal and solubles, and poultry byproducts. (Quantity modified to represent 60-percent protein for all products. Data are from table 3.)

Figure 3 indicates that the present production of the three poultry byproducts is equal to the domestic production of fish meal. Actually, the production of poultry byproducts probably is greater than the data show in view of the fact that the most recent available data on the proportions of poultry wastes converted to byproducts are those compiled in 1955 (Davis et al 1961). These conversion rates with the most recent poultry production data available (United States Department of Agriculture 1961) were utilized in arriving at the poultry byproducts output levels given in table 3.

How great a share of the market will be taken by poultry byproducts in the future? To get an approximate answer, we have to glance at the history of the poultry byproducts industry. Feather meal was virtually unheard of prior to 1950, but by 1955, 46 percent of the output of poultry feathers was being converted into feather meal; this means that together with those feathers utilized by farmers and dealers, 76 percent actually was utilized. Almost without doubt, the proportion converted to feather meal has increased since

1955. Recovery rate of offal was already 90 percent and of blood 44 percent in 1955, and it is not unlikely that those rates also have increased. It seems reasonable to assume that a large part of all the poultry waste now available is being converted into protein concentrates.

While an increase in poultry production doubtless will result in an increased output of byproducts, it likewise can be expected to increase the amount of fish meal required for poultry feeding. It follows that production of the poultry byproducts in relation to fish reduction products is now fairly stabilized just as the production of protein concentrates from packinghouse wastes has been for many years, and there is no reason to believe that those protein concentrates will offer greater competition to fish meal in the future than they do at present unless price shifts or other economic phenomena alter the situation.

IDENTIFICATION OF THE FISH GROWTH FACTORS

Will the demand for fish meal and solubles decline if the fish growth factors are identified? Perhaps you have heard someone remark: "The minute the fish growth factors are identified, the market for fish byproducts will go to pieces."

Researchers are making an intensive search for the unidentified growth factors of fish meal; recently a number of different groups have reported progress. Mason, Sacks, and Stephenson (1961) report that the growth response of chicks to condensed fish solubles is caused by both organic and inorganic constituents, copper and molybdenum being included in the latter. Runnels and Snyder (1960 and 1962) report the presence of a growth factor in the ash of incinerated chicks. The early literature has been reviewed by those workers. One group (University of Wisconsin News Release, December 27, 1961) has been able to concentrate the factors sufficiently well to enable a ration that contains only one-sixth percent concentrate to be as effective as one that contains fish solubles at the 2-percent level.

Even if the fish growth factors should become available in inexpensive forms, however, there is no reason to expect the market for fish reduction products to disappear; meal and solubles always will be valued for their protein content. What will be necessary to maintain the market will be an increase in sales and public relations effort. It will be necessary to remind buyers that fish meal is one of the best protein concentrates available. Also, it may be necessary to educate users as to the special values possessed by fish meal. They must be made to realize that:

1. Fish meal is made up of proteins of high quality with (a) a favorable distribution of amino acids and (b) a high nutritional availability of those amino acids.
2. Fish meal incorporates high levels of methionine and lysine, amino acids that are valuable in corn-soy and other feed mixtures in which levels of those amino acids are low.
3. Fish meal contains valuable B-complex vitamins.
4. Fish meal contains liberal amounts of phosphorus and calcium plus other needed elements, including essential trace elements.
5. Fish meal helps maintain rapid growth of young swine and poultry despite stress factors.
6. Fish meal, in correctly formulated rations, helps keep hens laying and is believed to assist in maintaining fertility of hatchery eggs.

Just as it will become increasingly necessary for fish meal producers to inform consumers of the values inherent in fish meal, it will also become increasingly important to guard against dissatisfaction on the part of fish meal users. The best way to satisfy the users is to provide a uniform product of the highest quality possible.

MAINTAINING AND INCREASING THE DEMAND FOR FISH MEAL

Fish meal producers in various countries (IAFMM Record of Proceedings 1961) agree that more emphasis must be placed upon quality of the product. However, an improvement in average quality will necessitate industry-wide agreement on a number of points such as minimal and maximal permissible levels of oil and moisture in fish meal, maximal allowable temperatures of scrap during curing, and methods of analysis; and until such agreement is reached, the achievement of uniform quality cannot be expected to materialize.

Manufacturers of mixed feed, while discussing the problem of standardization of fish meal with personnel of the Technical Advisory Unit, have offered what may be an interim, partial solution. The feed producers suggested that it is important to have quality information, in advance, on each shipment of meal. Some stated that if they knew what to expect, they could plan accordingly, and quality of the meal would not then be such a crucial matter. One feed producer offered the following example: "We received a shipment of fish meal that was 20-percent oil, but we had been told of this fact in advance and were able to plan accordingly. We used that batch of meal without delay and everything worked out fine."

Several feed producers spoke of receiving fish meal containing a high percentage of bones ranging up to 2 inches in length and meals containing excessively high levels of oil and moisture, or with a scorched odor. Those men pointed out that they know how to utilize fish meal that falls short of perfection provided they have advance information as to the characteristics of a given shipment.

If uniform trade descriptions could be adopted, they would facilitate use of the product at the feedmill. For instance, the degree to which an unwanted odor is present in meal could be described in a standardized manner according to prior agreement. The presence of large particles in meal and their frequency, as well as percentages of moisture and oil, could also be mentioned. These simple statements of fact would go a long way toward increasing consumer acceptance of fish meals that vary in degree of excellence.

The idea that uniform trade descriptions be adopted was put forth by conscientious businessmen who sincerely believe that the eventual benefits to fish meal producers will far outweigh the immediate disadvantage. Producers of fish meal therefore may wish to give the idea serious consideration with a view to securing industry-wide cooperation to achieve the goal. Merchandising of fish reduction products may require more public relations work and plain salesmanship in the future than it did in the past, and accurate trade descriptions on an industry-wide basis will constitute an excellent starting point toward improved relations with consumers.

SUMMARY

Knowledge of past and present production levels of fish meal, solubles, and other protein concentrates was extrapolated to suggest future trends of the industry. On this basis, it may be concluded that:

1. Potential use of fish meal in this country is much greater than present consumption.
2. Although imports of fish meal have increased rapidly during the past few years in proportion to domestic production, viewed over a period of the past 21 years, both domestic production and imports have in general increased gradually. It would be unwise to extrapolate data from import data during the recent past in order to predict future imports.
3. Production of meat scrap and tankage, which constitute the largest output of animal protein concentrate, has doubled in two decades. Production of poultry byproducts--including feather meal, poultry meat scrap, and blood meal--has grown from nothing 12 years ago to tonnages comparable with the domestic production of fish meal during the past few years. It is impossible for production of protein concentrates of the latter varieties to increase appreciably, unless poultry production also increases, if most of the poultry waste that can be

converted economically to concentrates is already being utilized; and there is good evidence that the major portion is being so converted.

4. Owing to the intrinsic values of fish meal as an animal protein concentrate, there is no reason to expect a rapid decline in its use even if the growth factors should be identified and manufactured cheaply, provided that improved merchandising techniques, more public relations effort, and greater salesmanship are employed.

5. To maintain the demand for fish meal, representatives of the industry should consider adoption of uniform standards of quality. In the meantime, the industry can maintain excellent relations by supplying buyers with accurate information concerning the quality of each shipment. In the face of impending changes, the industry may find that it will be good business to adopt this policy soon.

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CERTAIN CANNED FISHERY PRODUCTS HEATED MAINLY BY CONVECTION

"Convection may be defined as the transfer of heat by currents. A pail of water heats mainly through convection, since water or other liquids tend to expand when they are heated, which decreases the density. The greater density of the colder liquid causes the heated liquid to rise and set up a circulation, thus distributing the heat throughout the mass. Transfer of heat by convection is very much faster than transfer of heat by conduction. Wet-pack shrimp, oysters, and "ready-to-serve" soups and chowders are products heated mainly by convection. Products in which convection currents are sluggish or absent due to a semisolid nature of the product, such as salmon, require much longer processing at a given temperature than products in brine or liquid in which convection currents are unhindered."

--Principles and Methods in the Canning of Fishery Products,
Research Report No. 7 (page 24),
U. S. Fish and Wildlife Service.

OYSTER INDUSTRY OF CHESAPEAKE BAY, SOUTH ATLANTIC, AND GULF OF MEXICO

By Charles F. Lee* and F. Bruce Sanford**

The Eastern oyster, known to biologists as *Crassostrea virginica*, once grew and thrived all the way from Maine to Texas. Huge piles of opened shells are evidence that oysters were plentiful in the area now known as New England and were relished by the Indians long before the Pilgrims landed.

Production of Raw Shucked Meats of Eastern Oysters						
Growing Area	1960		1958		1950	
	1,000 Lbs.	Percent of Total	1,000 Lbs.	Percent of Total	1,000 Lbs.	Percent of Total
New England States (R.I., Conn., Mass.)	500	1.0	276	0.5	4,727	6.9
Middle Atlantic (N.Y., N.J., Del.)	1,154	2.4	4,296	7.8	18,170	26.7
Chesapeake Bay: (Md., Va.)	27,111	55.3	37,530	68.0	29,953	43.9
South Atlantic (N.C., S.C., Ga.)	4,119	8.4	2,651	4.8	3,034	4.5
Gulf (West Fla., Ala., Miss., La., Tex.)	16,098	32.9	10,408	18.9	12,292	18.0
Total	48,982	100	55,161	100	68,176	100

Reference: Fishery Statistics of the United States for 1950, 1958, and 1960. E. A. Power, Chief, Branch of Statistics, Bureau of Commercial Fisheries.

As recently as 1950, Rhode Island and Connecticut produced almost 5 million pounds of oyster meats, amounting to 7 percent of the total production (see table). For that same year the Middle Atlantic States of New York, New Jersey, and Delaware produced over 18 million pounds of shucked oysters, equal to 27 percent of the total, compared to 5 percent for the South Atlantic and 18 percent for the Gulf States. Chesapeake Bay produced 44 percent.

CHANGES

During the past decade, the fortunes of many of the oyster-producing areas have changed dramatically, and unfortunately, for the worse. Changing biological and ecological factors have usually combined to effect this widespread reduction in the oyster harvest. In some regions the growth of large waterfront



Fig. 1 - Most oysters are harvested with medium-size power dredge boats, though in Maryland, because of a State law, dredgers must still rely on sail power. Some dredge boats are very neat and trim.

*Chemical Engineer, Fishery Technological Laboratory, College Park, Md.
**Chemist-in-Charge, Branch of Reports, Seattle, Wash.



Fig. 2 - Large plants employ larger dredge boats.

U. S. Bureau of Commercial Fisheries.

communities and industries has overrun formerly valuable oyster-growing areas. Of greater importance are the multitude of biological enemies. Starfish, drills, mud worms, boring sponge, large predators such as drumfish and crabs, and, worst of all, several microscopic organisms have weakened or killed uncounted millions of oysters of all ages.



Fig. 3 - This plant has a dock conveyor system by means of which eight large dredge boats can be unloaded at one time.

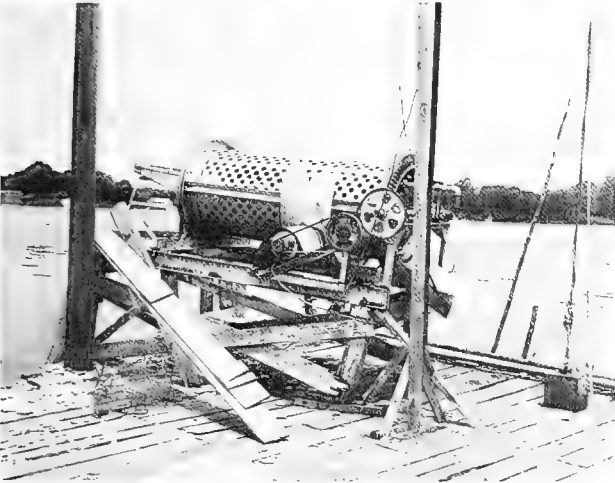


Fig. 5 - If a shellstock washer is used, much of the mud and debris can be removed before the shellstock is carried into the plant.



Fig. 4 - Shown in the foreground is a rotary washer for the shellstock.

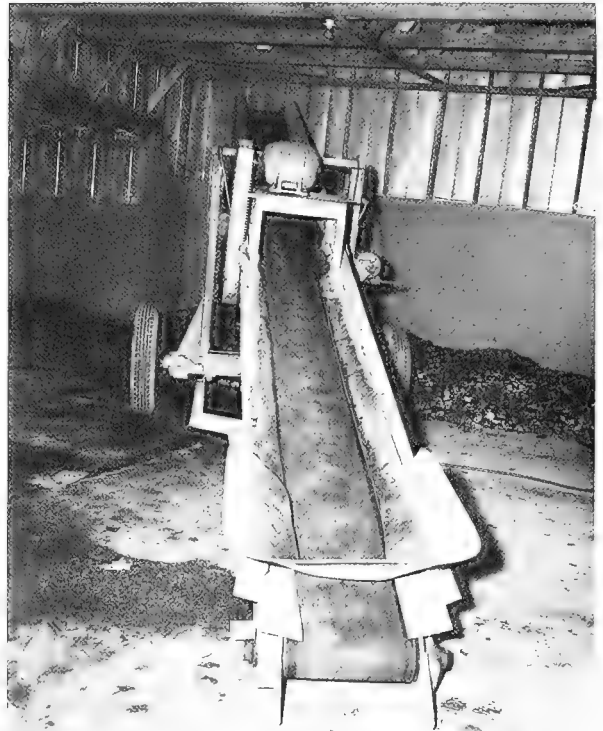


Fig. 6 - Portable conveyors are often used to move shellstock from boat to storage area.

Adverse ecological conditions have eliminated millions more. Hurricanes and lesser coastal storms, for example, have covered and destroyed hundreds of acres of marketable oysters, and less dramatic but almost as extensive damage especially in the Southern States, has resulted when the runoff following heavy rains has made the waters over the oyster beds

too fresh for oyster survival. Silting is another hazard, sometimes resulting from heavy run-off, and in some areas as a side effect of dredging operations.

Thus, the industry, particularly that of the Central and North Atlantic Regions, has suffered a continued decline in the harvest of oysters and the production of shucked oysters. In 1958, the last year for which complete records are available, New England produced only 0.5 percent and the Middle Atlantic 8 percent of the total quantity of shucked oysters. The most recent data available, for 1960, show that the production in the Middle Atlantic states was only 2.4 percent. In most areas, surviving oysters are so sparsely distributed that it is no longer economical to attempt their harvest. Indirectly, this may result in the development of a resistant stock and recovery of the oyster fishery.



Fig. 7 - This plant uses a hand truck and wire baskets to carry shellstock from storage room to shuckers' benches.



Fig. 8 - Floors in storage areas or plants are made of concrete.

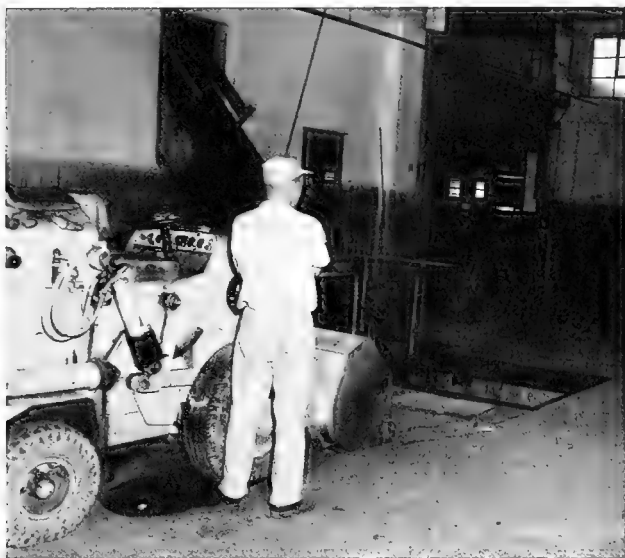


Fig. 9 - This plant uses a tractor to move shellstock into chutes feeding to the shucking room.



Fig. 10 - This filling hopper and the V-shaped "cars," which ride an endless track, make a conveyor system that was especially designed for maximum flexibility in moving the shellstock to the shuckers.

These drastic losses in production in the North have made the Chesapeake Bay, and more especially the South Atlantic and Gulf the principal source of supply of our "Eastern" oyster. As can be seen in the table, the oyster production for 1960 for those regions not only represents a greater proportion of the remaining production but the actual level of production has been raised to new high levels. The percentage of the total production coming from those two regions increased from 24 percent in 1958 to an unprecedented 41 percent in 1960.



Fig. 11 - The small steel anvil in the shucking block is used to crack the thin edge or "bill" of the oyster.

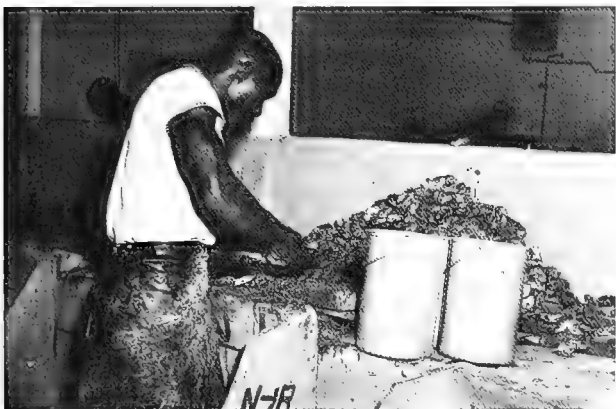


Fig. 13 - Science has yet to perfect a machine for opening raw oysters. The first step in shucking an oyster is to force the knife between the edges of the shell. The upper muscle is then cut loose.



Fig. 15 - Another stroke of the knife cuts the muscle loose from the bottom shell, and the shucker then flips the meat into the shucking pot. In most Chesapeake Bay plants, each shucker has 2 or 3 pots for different sizes, and he does all grading for size.



Fig. 12 - These shucking benches have overhead bins. Large rubber pipes under the bench carry empty shell to a basement conveyor system.



Fig. 14 - The upper shell now is wedged off by a twist of the knife.



Fig. 16 - In some areas, shell oysters are brought to the shucking plants in bags. Shuckers may be paid by the number of bags shucked rather than by the volume of shucked oysters--hence the compartmented benches.



Fig. 17 - Pail of shucked oysters is taken to the delivery window of the washing-packing room.



Fig. 19 - Chesapeake Bay plants use blowers to clean the shucked oysters. In this plant, blowers are mounted high enough so that they discharge through the open gate-valve directly onto the packing skimmer. Note the slotted collar to retain oysters during the overflow rinse period.



Fig. 21 - Oysters are bailed from the low-mounted blower tanks in this installation. Tanks may hold 20 to 40 gallons of oysters.



Fig. 18 - In many Gulf Coast plants, oysters are washed, 1 or 2 gallons at a time, in a dishpan with flowing water. The washing period is usually about 3 to 4 minutes.



Fig. 20 - Shown here is another high-mounted blower installation. These two medium-size tanks would handle oysters from 20 to 30 shuckers. Small plants employing up to 15 shuckers often have only one blower.



Fig. 22 - One worker empties the tank while the "skimmerman" fills a 5-gallon measure. Oysters are held in the 5-gallon cans (foreground) until they can be packed into smaller units. Often this repacking will be done in a large central plant.

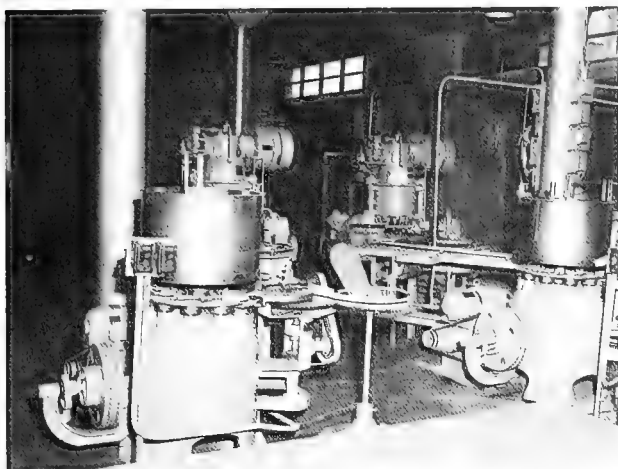


Fig. 23 - These are automatic filling machines for pint, 12-, or 10-ounce cans. Ten gallons or more of oysters are emptied into the top tank, and they finish up in hermetically-sealed small units.



Fig. 25 - A mechanically vibrated packing skimmer may also be used.



Fig. 27 - Cans are thoroughly iced before being shipped. A number of plants now have their own flake-ice machines to assure a plentiful supply.

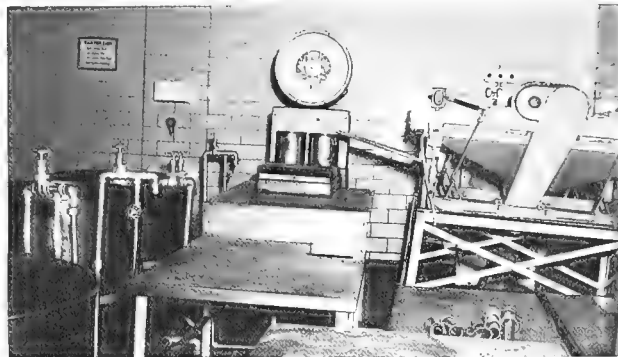


Fig. 24 - This plant uses a power-driven vibrating delivery skimmer and weighs the drained oysters instead of measuring the volume.



Fig. 26 - Plant operators ship their cans of oysters in wooden barrels or in fiber boxes. Gallons or retail-size units of a pint or less are the sizes of containers used both in the South and the East.



Fig. 28 - Many plants have large cold rooms for holding shucked oysters until they are shipped.



Fig. 29 - Some oysters are frozen in small cans. In this method of packing, the weight of oysters in each can must be checked on the scales because cans cannot be completely filled, owing to the expansion of the product when frozen.



Fig. 31 - Space is left between units to permit circulation of the freezing air blast.

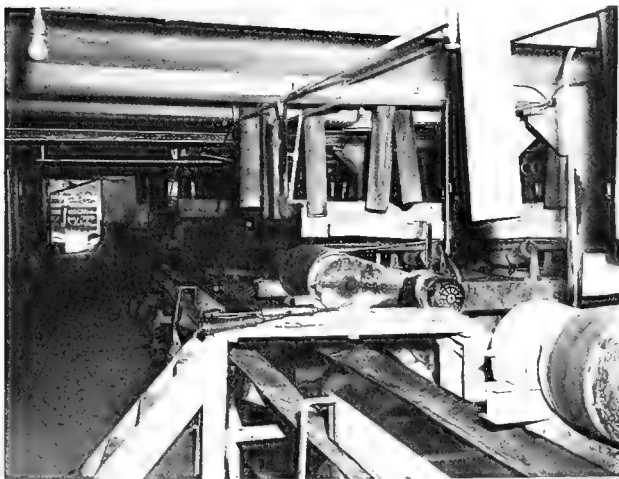


Fig. 33 - This plant uses a complex system of conveyors to collect the shell discharged through the pipes from the benches and to move the shell to the storage piles.

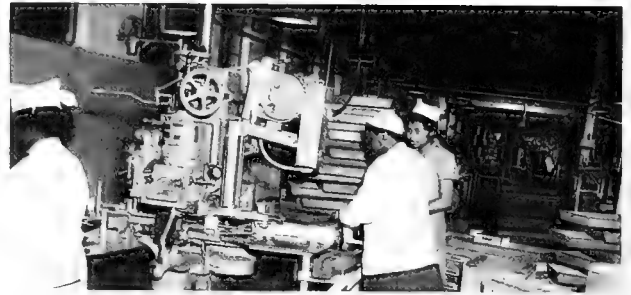


Fig. 30 - The sealed cans are packed into metal trays for freezing.



Fig. 32 - Large volumes of empty shell accumulate from the shucking operation. In some plants, the shell is moved by wheelbarrow to the shell pile.



Fig. 34 - During the summer, the huge piles of shell accumulated during the "R" months are put back onto the seed beds to serve as "cultch" for the young oyster spat. The crane is used to move the shell to a barge.



Fig. 35 - This self-powered conveyor-loader is also used to load shell into barges or trucks.



Fig. 37 - In some states, the conservation department buys shell to "plant" on and improve public growing areas. Here the Uranus, Mississippi Marine Conservation Commission Patrol Vessel, is tied alongside a barge load of shell intended for this purpose.



Fig. 39 - Canning oysters is an important industry in the South. Canneries start operations in the Spring when the yield per bushel of oysters is at its seasonal high. The shellstock is washed to keep mud and debris from the cookers.



Fig. 36 - The barge shown here is used to carry the shell to the seed-growing areas.

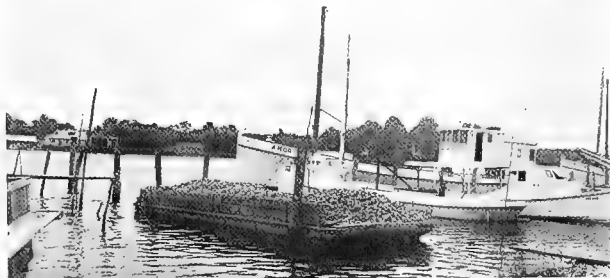


Fig. 38 - After the oyster "spat" (pin-head-size oysters) set on the clean shell, they are left to grow a year. They then are usually taken up during the summer and moved to areas where conditions are better for fast growth. This small barge load of 1-year-old or "seed" oysters is on its way to the growing beds.



Fig. 40 - One oyster cannery uses vertical autoclaves, filled from overhead conveyors with the raw shellstock, for cooking the oysters.

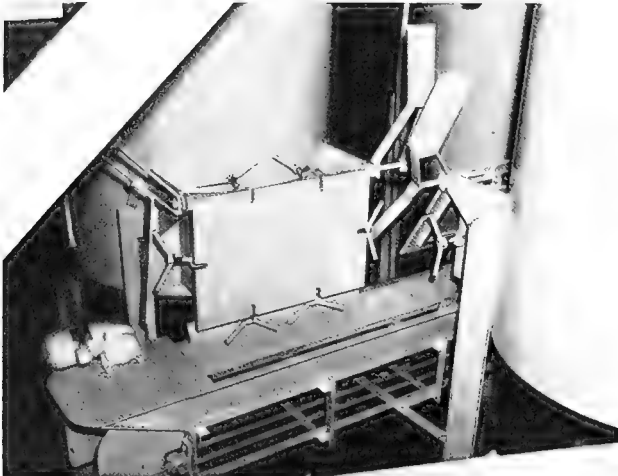


Fig. 41 - When the cook is completed, the bottom gate is unclamped, and the shellstock is discharged to a second conveyor. Conveyor belts have been removed during off-season painting and maintenance operations.

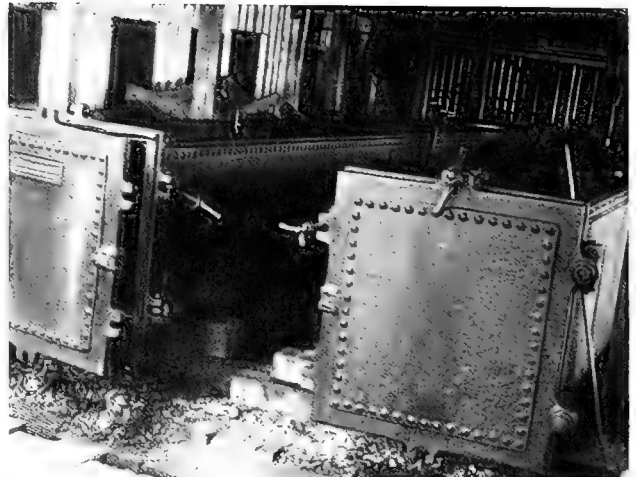


Fig. 42 - Most of the oyster canneries use low-pressure horizontal retorts for steaming the shell oysters.



Fig. 43 - Metal-slot cars hold the shellstock during steaming. On the left is a specially designed shellstock washer with mesh belt removed.

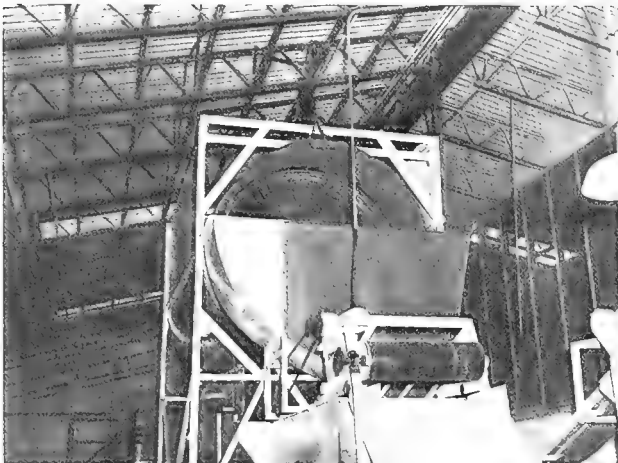


Fig. 45 - The shell passes through to a discharge conveyor (belt removed) and is carried out to the shell pile.

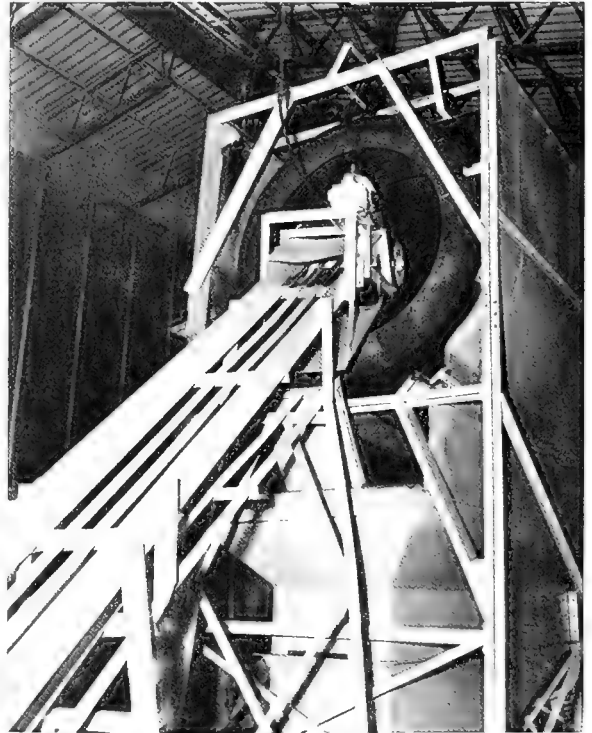


Fig. 44 - Almost all canneries now have replaced hand labor with some modification of the mechanical shucker shown here. The steamed shellstock is tumbled in this rotating cylinder. The meats are shaken loose and fall through the slots into the tank below.

In addition to producing fresh-shucked oysters, the Southern States are the only producers of canned Eastern oysters. In 1958, 29 plants processed nearly 270,000 standard cases valued at \$3.7 million, down 46 percent in quantity and 47 percent in value compared to the pack of 1950, but still economically important.

VAST ENTERPRISE

Statistics, however, cannot convey a real picture of the vast enterprise required to bring oysters to the consumer. It is an industry of tremendous variety and of human as well as pictorial interest. Oyster plants range in size from a small family operation in the marshland with 3 to 4 shuckers to huge city plants employing a hundred times that many. Equipment ranges from the shovel and wheelbarrow for moving the live oysters in the shell (or shellstock as it is commonly known to the industry) and empty shell, to completely mechanized handling from boat to shucker and shucker to shell pile. Washing equipment may be one stainless steel dishpan or eight large blowers, each of which may clean 40 gallons of oysters at a time. Yet that one vital human link--the shucker--still holds his own.

The series of photographs gives a cross-section of the fishery. Typical Gulf Coast plants are included as well as several plants in the Chesapeake Bay region.

Note: Acknowledgements: The authors gratefully acknowledge the cooperation of the oyster industry, the following members of which contributed directly to the production of the report: Joseph Jurisich, Popich and Jurisich, New Orleans, La; Chester Delacruz, Southern Shell Fish Company, Inc., Biloxi, Miss.; Mississippi Marine Conservation Commission, Biloxi, Miss.; C. A. King, Ocean Lake and River Fish Company, Beaufort, S. C.; H. C. Travers, Shellmore Oyster Company, McClellanville, S. C.; William Ballard, Ballard Fish and Oyster Company, Inc., Norfolk, Va; Frank Miles, J. H. Miles and Company, Inc., Norfolk, Va.; D. P. Elliott, G. T. Elliott, Inc., Hampton, Va.; The Hogg Brothers, Hogg's Oyster Company, Gloucester Point, Va.; Cranston Morgan and Raymond Morgan, W. F. Morgan and Sons, Inc., Weems, Va.; Harmon Treacle, Irvington Packing Company, Inc., White Stone, Va.



Fig. 46 - Canneries also replant the empty shell on seed beds. Note the portable gasoline-powered pump on the shell barge. This pump throws a powerful stream of water, which washes the shells overboard, and distributes them on the beds. In this manner, the cycle of operations necessary to bring oysters to the consumer begins once again.



OYSTER GRABS

This is an implement used for taking oysters on the tidal flats of South Carolina and Georgia. It consists of a pair of jaws with a fulcrum close to the terminal end and is operated like a pair of scissors.



Oyster grabs.

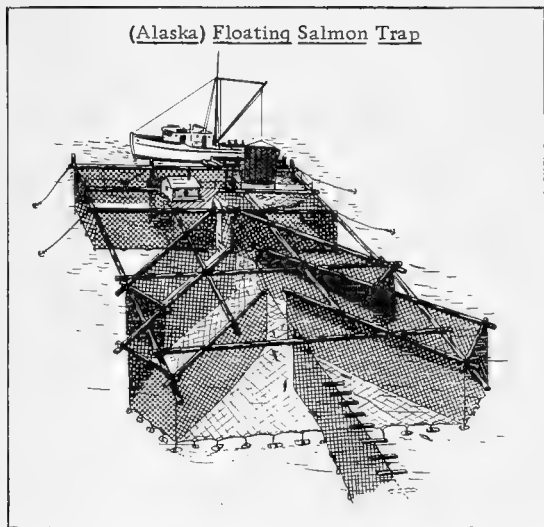
Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

TRENDS AND DEVELOPMENTS

Alaska

APPROVAL OF METLAKATLA FISH TRAPS GIVEN FOR 1963:

The Secretary of the Interior has announced that the Alaska Indian community of Metlakatla will continue the use of fish traps for salmon during the 1963 season. The Metlakatlans have been allowed to fish with traps since 1915 under Secretarial regulations. The Supreme Court ruled in 1962 that the Alaska law prohibiting fish traps in the interest of conservation does not apply to Annette Island where Metlakatla is located. The Secretary said it was desirable to delay changing the



1915 regulations to bring them into harmony with state law until suitable alternatives to the use of traps have been developed. This will permit the Metlakatla Indians to maintain the level of fish production upon which their salmon cannery depends. The cannery is the economic mainstay of the community.

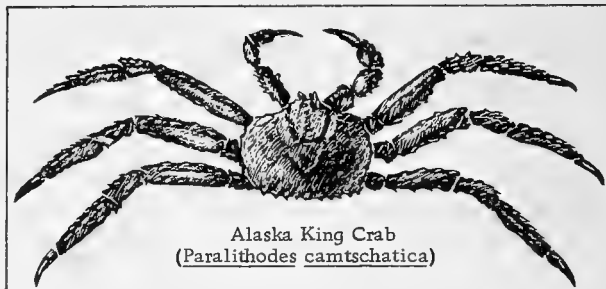
BUREAU OF INDIAN AFFAIRS STUDY PLANNED ON SOUTHEAST SALMON CANNERIES:

A \$44,000 study to find additional uses for five native-owned and operated salmon can-

neries in Alaska has been approved by the Bureau of Indian Affairs. The study is to be made by the Battelle Memorial Institute of Columbus, Ohio, the Alaska congressional delegation stated. The study will cover the villages of Angoon, Kake, Klawock, Hydaburg and Metlakatla.

REVISED FISHING REGULATIONS ISSUED:

Changes in major commercial fishing regulations by the Alaska Department of Fish and Game became effective on February 3, 1963. Changes of interest provided for by



the regulations were: (1) the use of monofilament purse seine web for salmon is prohibited, (2) the use of purse seines and leads to form traps for taking salmon is prohibited, (3) diving gear may be used to take king crab, (4) minimum size of king crab was increased from 6½ inches to 7 inches in the Kodiak area, and (5) the prohibition on the herring reduction fishery in the southeastern area was rescinded.

MARKETS FOR TANNER CRABS PROMISING:

Representatives of a California enterprise attempting to utilize Alaska tanner crab resources visited the Bureau's Exploratory Fishing and Gear Research Base at Juneau to review available knowledge on the abundance of that species. They stated that experimental marketing in the San Francisco area has

resulted in enthusiastic response by local brokers.

* * * * *

THREE KING CRAB FACTORYSHIPS TO OPERATE TO THE WESTWARD:

Three king crab factoryships will operate with catcher boats this season in the Adak area of the Aleutian Islands. A smaller factoryship will operate in the Kodiak area. All are associated with an Alaska fishing company. One of the larger factoryships can process 8,000 crabs a day, the other 4,000. The group was expected to pack about \$1.5 million worth of crab in about four months.

* * * * *

CRAB STUDIES SHOWS PROGRESS:

Analyses of all samples from the first block of king crab meat of the series of "drip" studies were completed in January at the Bureau's Ketchikan Technological Laboratory. The percent of nitrogen in a low ionic strength extract of the combined meat and drip showed no apparent regression on percent of drip. This suggests that the increase in nitrogen content with increased drip previously reported was probably a solubility effect, i.e., the more drip there is the more nitrogen is leached out.



Alaska Fisheries Investigations

COOK INLET KING CRAB FISHING BEST EVER:

According to a shellfish biologist of the Alaska Department of Fish and Game, Cook Inlet king crab fishermen had better fishing in 1962 than any previous year on record. The total catch for the Inlet that year was 6,705,000 pounds. The crabs averaged 8.9 pounds each. At present there are three major areas of Cook Inlet where the crab are caught. They are Kamishak Bay on the west side of the Inlet, which produced 4,163,000 pounds, Kachemak Bay on the east side of the Inlet, which produced 1,958,000 pounds, and the new crab fishing area off the tip of the Kenai Peninsula where 584,000 pounds of crab were caught. Kamishak Bay has produced the greatest number of crab recently. In past years the entire catch for the district came from Kachemak Bay.

* * * * *

AGE OF RED SALMON SMOLTS RELATED TO LOCATION OF SPAWNING:

Bristol Bay red salmon studies are showing that location of spawning grounds within the large Naknek System may determine how long the fry feed in Naknek Lake before departing for the ocean. Scale samples collected in 1962 from the spawning areas of the Naknek System were recently read for age. Indications are that a majority of the young fish from the upper lakes (Coville and Grosvenor) remain three years in fresh water, whereas young fish from tributaries emptying directly into Naknek Lake spend two years in the lake. Netting in the interconnecting streams has shown that fry of the year migrate from the upper lakes toward the end of the growing season and accumulate in Iliuk Arm or South Arm of Naknek Lake. There they remain for an additional growing season subject to fresh-water mortalities before migrating to sea as smolts.

* * * * *

KARLUK RED SALMON RACES SHOWN BY FECUNDITY DIFFERENCES:

Studies of the fecundity of female red salmon spawning in Karluk Lake tributaries show significant differences between spring and fall run salmon in the same stream. Significant differences in fecundity were also shown between spring run salmon in the different tributaries to Karluk Lake. Those findings lend support to the theory that different subpopulations exist within the Karluk System. These will have to be considered in any comprehensive management program for maximum sustained yield.

* * * * *

PINK SALMON EGG MORTALITIES FROM OVERSPAWNING:

Preserved eggs from the October 1962 sampling of the pink salmon spawning riffles at Olsen Bay in Prince William Sound have been counted and those from the special study area show a heavy mortality largely due to the late spawners disturbing eggs from the early spawners. From the creek water temperatures, it was determined that all pink salmon eggs deposited prior to July 28 should have been in the sac fry stage in October. There were over 900 eggs per square meter on July 28, but only one-tenth as many fry per square meter in the October samples. The exceptionally heavy spawning escapement in 1962 provided a good opportunity to measure the effects of over spawning.



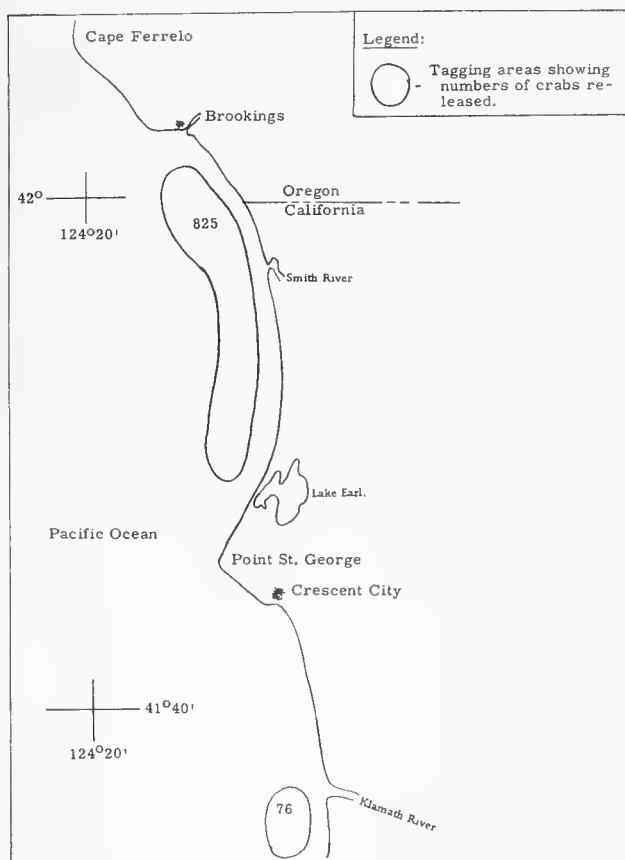
California

DUNGENESS CRABS IN NORTHERN CALIFORNIA AND OREGON WATERS STUDIED:

M/V "N. B. Scofield" Cruise 62-S-8 (November 19-December 14, 1962): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in the coastal waters off California

Crabs Caught by the N. B. Scofield on Cruise 62-S-8					
Crab Groups	Number of Crabs	Range, Shoulder Width		Average Shoulder Width	
		Mm.	In.	Mm.	In.
Juveniles	43	15-52	0.6-2.0	23	0.9
Sublegal males	1,646	77-158	3.0-6.2	136	5.4
Gravid females	303	117-164	4.6-6.5	145	5.7
Nongravid females	314	99-167	3.9-6.6	130	5.1
Legal males	913	158-208	6.2-8.2	171	6.7

between Cape Ferrelo, Oreg., and the Klamath River, Calif., were: (1) to tag legal male crabs for population and migration studies in cooperation with the Oregon Fish Commission,



Cruise 62-S-8 by research vessel N. B. Scofield showing tagging areas and number of crabs released.

(2) to determine crab sizes, sex ratios, and condition during tagging operations, and (3) to survey the northern California crab stocks to determine abundance, sizes, sex ratios, and condition prior to the beginning of the 1962/63 fishing season.

Tagging operations received priority and the survey portion of the original cruise plan was abandoned due to bad weather.

During 11 operational days, a total of 540 sets of commercial 40-inch diameter traps were made in depths of 10 to 40 fathoms. Traps were grouped in strings of 10 at 20 locations and in strings of 20 at 17 sites.

Legal male crabs (6.25 inches shoulder width or 7 inches in greatest width were marked with neon-red Peterson discs at the lateral margin of the carapace. During the cruise, 901 crabs were tagged and released. In the area between Brookings, Ore., and Lake Earl, Calif., 825 crabs were released in 10 to 17 fathoms. Seventy-five crabs were released in 13 fathoms and one in 22 fathoms off the Klamath River. The goal of 2,000 tagged crabs was not reached due to the scarcity of crabs. Several tagged crabs were recovered by commercial fishermen before completing the cruise.

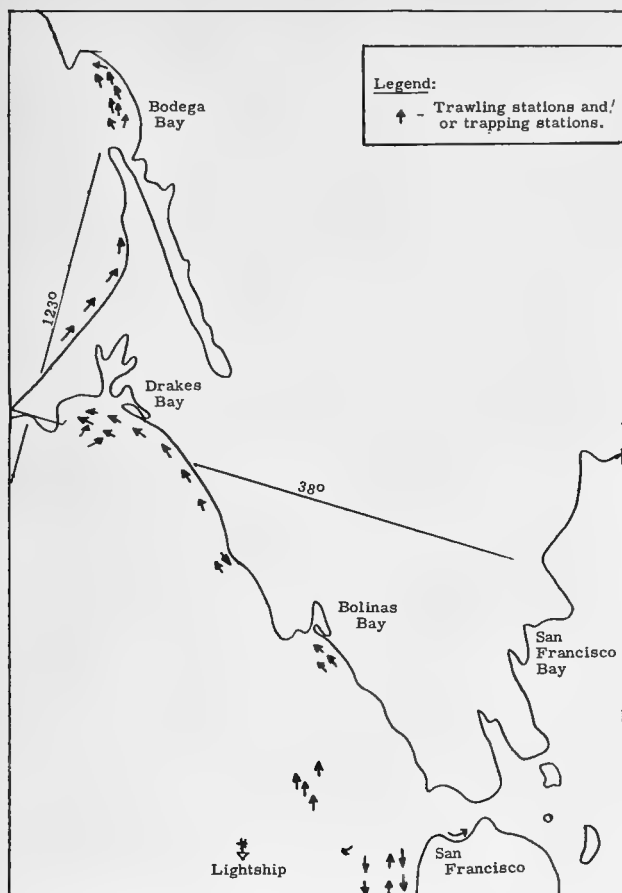
All crabs captured were in good condition. Only 15 (1.64 percent) of 913 legal male crabs had soft shells. The 303 gravid female crabs were carrying reddish-orange egg masses, a color characteristic of early development.

* * * * *

GROWTH AND LIFE HISTORY OF DUNGENESS CRABS INVESTIGATED:

M/V "Nautilus" Cruise 62-N-2g-Crab (July 16-20, 1962), 2h (August 13-17), 2i (September 10-14), 2l (December 10-14): The second series of cruises by the California Department of Fish and Game research vessel Nautilus in the coastal waters off central California from Bodega Bay to San Francisco was completed on December 14, 1962. The objectives of the cruises were: (1) to collect dungeness (market) crabs (*Cancer magister*) for growth studies by using traps and trawl, and (2) to study other aspects of the life history of market crabs.

Collections were made at selected stations from Bodega Head to San Francisco using a 10-foot beam trawl with 1-inch mesh net,



Cruises 62-N-2g, h, i, and 1-Crab by research vessel *Nautilus*, showing location of trawl and trap stations.

commercial-type crab traps, and 1-inch mesh crab traps. The crab traps were baited with squid and rockfish and fished overnight. Beam trawling was done at each station. Each tow lasted about 20 minutes and covered three-quarters of a mile. Exploratory beam trawling was accomplished at stations where traps were not set.

The captured crabs were calculated to be 18-20 months old (from time of hatching) and were in their 9th, 10th, and 11th instars. The maximum size attained by 20-month-old crabs is estimated as 133 millimeters (5.2 inches).

Growth of males and females was equal until July when the males began to outgrow the females. This growth differential was very obvious in September.

Maturity studies were conducted to determine the age at maturity. Females 81 to 140 millimeters (3.2-5.5 inches) were examined in August and September for ovary changes

and the presence of sperm. All females larger than 112 millimeters (4.4 inches) had ovaries that were developing color, indicating incipient spawning. Females smaller than 109 millimeters (4.3 inches) did not show color changes. Spermathecal examinations revealed that females smaller than 100 millimeters (3.9 inches) had not been fertilized, but 99 percent of the females larger than 108 millimeters (4.3 inches) had sperm in the spermatheca. From the September sample, it was determined that 77 percent of the females were 109 millimeters and less in shoulder width. From this sampling, it was concluded that maturation of developing eggs was occurring in only 23 percent of the female crabs in the fall of their second year of life, but 76 percent were fertilized in their second year.



Cans--Shipments for Fishery Products, January-November 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-November 1962 was 6.1 percent above that used during the same period in 1961.

Prior to 1962, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. Use of aluminum cans for packing fishery products is small.



A total of 2,845,030 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first 11 months of 1962, whereas in the same period of 1961 (when only tinplate was reported) 2,680,951 base boxes of steel were consumed. The increase was due mainly to larger canned packs of Maine sardines, shrimp, salmon, and tuna during 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.



Central Pacific Fisheries Investigations

CLUES TO DISTRIBUTION OF YOUNG ALBACORE TUNA FOUND BY STUDY OF PREDATORS' STOMACHS:

As part of the albacore ecology program, staff members of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu have been routinely examining the stomachs of large fish landed at the Honolulu fresh fish markets and on cruises of the Laboratory's research vessel, the M/V Charles H. Gilbert, in order to monitor the occurrence of juvenile albacore. Although young tuna of other species have been successfully captured by midwater trawls, plankton tows, and dip-netting at night-light stations, these methods have not been successful in capturing juvenile albacore. At present, the most promising "collectors" of juvenile albacore appear to be the large pelagic fish which prey on them.

Since the inception of this project, a total of 12 juvenile albacore has been found. These were found in stomachs of predators caught in widely scattered locations, from 171°02' E. long. to the Hawaiian Islands, between 19° and 24° N. lat., in the North Pacific, and 178°46' E. to 162°45' W. long., between 06°32' S. and 15°35' S. lat., in the South Pacific. The discovery of these juveniles tends to corroborate past studies on the spawning of albacore, based on gonads, which indicated that albacore may spawn over wide areas in the North and South Pacific.

As would be expected of specimens found in stomachs, most of the juveniles were somewhat damaged by digestion. However, the specimens were easily recognized as scombrids by the body contours and the shape of the head. They were positively identified as albacore on the basis of a striking vertebral character which is definitive for albacore, plus other supplementary characters. This striking character is the unique laterally flattened shape of the haemal spine on the first caudal vertebra in the albacore. It is interesting to note that although in the past several investigators studied the morphology of the albacore in great detail, the diagnostic value of this character was not recognized by any of them. It is only relatively recently that this character has been used in identifying albacore, especially those occurring in stomachs, or predators. Albacore were identified as small as approximately 6 centimeters (about 2.4 inches) in fork length by this character.

Efforts to sample juvenile albacore by the examination of the stomachs of predators will be intensified. As more juveniles are recorded, major spawning and nursery grounds of albacore in the North and South Pacific may be located. Adequate sampling throughout the year will help elucidate the problems of seasonality of spawning and age and growth during the early stages of the albacore's life history.



Federal Purchases of Fishery Products

VETERANS ADMINISTRATION REQUIREMENTS FOR CANNED FISH FROM NEW PACKS:

Early in 1963 the Veterans Administration announced its estimated requirements of various

Veterans Administration Requirements for Canned Fish from New Packs		
Canned Products	Can Size	Quantity (Dozen Cans)
Salmon, red or sockeye	1 lb.	22,800
Salmon, red or sockeye, dietetic.	No. 1/2	8,700
Sardines	No. 1	4,800
Tuna, light meat, chunk, in vegetable oil	4 lbs.	6,300
Tuna, dietetic.	No. 1/2	8,900

ious canned food products, including fishery products.

Items listed are purchased by the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill.



Gulf Exploratory Fishery Program

"OREGON" PARTICIPATES IN INTERNATIONAL SURVEY OF TROPICAL ATLANTIC:

The U. S. Bureau of Commercial Fisheries exploratory fishing vessel M/V Oregon (Cruise 84) left on February 4, 1963 for a 2-month cruise in international waters off the northeastern coast of South America.

The Bureau's vessel will comprise one unit of the International Cooperative Investigation of the Tropical Atlantic (ICITA) investigation and will maintain radio contact with other vessels of the investigation, including the Bureau's newly acquired Geronimo, the

U. S. Coast and Geodetic Survey vessel Explorer, 2 vessels (the Chain and the Crawford) from the Woods Hole Oceanographic Institution, and oceanographic and naval vessels assigned to the ICITA by the Governments of Argentina, Brazil, Ivory Coast, Nigeria, Congo, and the Soviet Union.

In addition to ICITA participation, for which hydrographic investigations will be undertaken, objectives of the cruise are: (1) to make a preliminary assessment of the distribution and availability to bottom trawls of the food fishes of the Continental Shelf off the Guianas and northern Brazil; (2) to extend shrimp explorations southeastward on the Continental Shelf to longitude 40° W., and on to the Continental Slope along the Guianas; and (3) to obtain additional information on the surface schooling tunas of the Gulf of Mexico, Caribbean Sea, and southwestern North Atlantic.



Halibut

HEARING HELD ON PROPOSED JAPANESE FISHING IN EASTERN BERING SEA:

A joint United States Senate-House delegation held a hearing in mid-February at Seattle, Wash., on the proposal to open the Eastern Bering Sea to Japanese halibut fishermen. The North Pacific Fisheries Commission (United States, Canada, and Japan) in November 1962 voted to open this area to Japanese fishermen for the first time. The Congressional delegation also investigated the effects of Japanese fishing on the valuable Bristol Bay run of red or sockeye salmon. The hearing followed a special meeting of the Commission early in February in Tokyo on conservation regulations for the proposed Japanese halibut fishery.

The annual meeting of the International Pacific Halibut Commission (United States and Canada) in Petersburg, Alaska, January 29-31 also preceded the mid-February hearing at Seattle.



Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES, PRODUCTION, JANUARY 1963:

Preliminary data on U. S. production of fish meal, oil, and solubles for January 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the

U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, January 1963 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homogenized ^{3/}
	Short Tons	1,000 Gallons	. . (Short Tons) . .	
January 1963:				
East & Gulf Coasts. .	524	7	84	50
West Coast ^{2/}	1,485	39	1,251	-
Total.	2,009	46	1,335	50
Jan. 1962 Total . . .	2,732	93	1,597	40

1/Does not include crab meal, shrimp meal, and liver oils.
 2/Includes Hawaii, American Samoa, and Puerto Rico.
 3/Includes condensed fish.

International Association of Fish Meal Manufacturers are shown in the table.

* * * * *

NEW USES FOR FISH OIL EXPLORED:

In order to promote greater use of fish oil in animal feeding, a U. S. Bureau of Commercial Fisheries animal nutritionist in late November and early December 1962 contacted representatives of corporations at Chicago and Cincinnati. Subsequently, he spent some time in Texas pointing out the values of fish products in livestock feeding to mixed-feed and livestock producers and studying the possibility of using fish oil in the huge cattle-fattening operations now being organized in the Western States.

A large producer of canned petfood, contacted at Chicago, now plans to experiment with fish oil in dogfood. The polyunsaturated nature of fish oil is expected to add to the glossiness of the dog's coat. If the experiments are successful, the concern will use fish oil in its commercial product, and doubtless other concerns will follow suit.

Some Texas mixed-feed producers use fish meal in liberal amounts in critical rations but, as a general rule, the level of utilization in that State is low, being only 2 or 2-1/2 percent even in critical rations. Several mixed-feed producers stated that they have never increased the level of fish meal in their mixed rations since the levels were lowered in response to the price rise that reached its peak in December 1958. Some feed producers feel that present prices of fish meal are high.

A special effort was made to determine whether or not fish oil can be used in the large-scale cattle-fattening operation now being started in the Western States. At present, heated fats are sprayed over hay just before it goes through a chopper, the fat serving to lubricate the chopper and reduce loss in the form of dust from 5 to only 1 percent of the hay. Off-hand, fish oil would appear to be superior for this use because it can be sprayed without heating. The polyunsaturated state of the oil would be no disadvantage because the chopped hay is consumed right after it leaves the chopper, and there would be very little opportunity for undesirable oxides to form. Specialists at a Texas college stated that they could see no reason why fish oil should not be tried in cattle feeding. A cattle feeder, to whom the college technologists broached the subject, agreed to use two tons of fish oil in feeding 100 head

of cattle if the oil was donated. The head of an animal science department in another Texas college agreed to carry out pilot studies on the use of fish oil in cattle feeding if the oil was supplied free.

The director of one of the smaller experiment stations in Texas is experimenting with menhaden oil at a level of 5 percent in broiler starter rations to be fed for a period of 5 or 5½ weeks. Following the starter ration, a finisher without fish oil will be fed. The objective of the trials is to find out whether or not undesirable flavors of poultry meat can be avoided when relatively high levels of fish oil are fed for a limited period of time.

The nutritionist of one Texas feed concern plans to use a blend of equal parts of menhaden oil and stabilize fat in poultry rations.

The Bureau's animal nutritionist was told by members of the staff of one southern university that since his visit last summer they have started experimenting with menhaden oil in grain rations for calves. At levels of 2½, 5, and 7½ percent, fish oil in the ration seems to be highly relished by calves, but at 10 percent there is some decrease in feed intake. No digestive disturbances or other unfavorable effects have been observed since the oil feeding was begun. No data on growth rates or feed efficiency are, as yet, available on these trials.

Note: See Commercial Fisheries Review, December 1962 p. 44.

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USE OF FISH OIL IN HIGHWAY CONSTRUCTION INVESTIGATED:

Possible use of fish oil in highway construction has been investigated by the Technical Advisory Unit of the U.S. Bureau of Commercial Fisheries. This investigation was initiated by questions from fish oil brokers who had heard of the possible use of fish oil in concrete and from fish oil producers and processors who were looking for improved outlets for byproducts, such as soap from alkali refining and stearine from cold pressing of fish oils. The use of fish oil in highway construction is based upon the need to increase the resistance of concrete to damage from repeated freezing followed by thawing with the heavy applications of salt used to reduce the hazard of winter driving under ice and snow conditions.

Highway builders have found that the best defense against serious surface scaling and structural breakdown of concrete under freeze-thaw conditions is the entrapment of many fine air spaces properly sized and distributed in the concrete. This is accomplished by entraining air bubbles in the concrete during the mixing. The size, distribution, and stability of these bubbles in the wet concrete is controlled through the use of an additive called an air-entraining agent, which is either mixed in the cement at the mill or used in solution as an admixture at the concrete mixer. Fish oil or its soaps can be used as such an air-entraining agent. In the early development of air-entrainment in concrete, fish oil figured prominently, but was dropped for economic reasons about 1940. Since that time both the techniques of air-entrainment and the price of fish oil relative to the currently used products have shifted toward easing the entry of fish oil into this market. The dominant products in this market today are neutralized pine resin and organic salts of sulfonated hydrocarbons. Prices are reported from a low of 5.5 cents a pound of solid material before neutralization in carload lots f.o.b. southern states to a high range of 65 cents to a dollar per gallon of solution. These solutions may contain from 8 to 25 percent of air-entraining agents and are intended for addition at the concrete mixer.

The market for air-entraining agents today for highway construction and for masonry cements amounts to about 10 million pounds per year. This market is even further expanded by the movement of air-entrainment into other applications such as dam construction, canal linings, and even into general structural concrete. The improved handling characteristics in pouring of the fresh air-entrained concrete

compared to regular concrete are extending the use of air-entrainment rapidly.

The first step in putting fish oil or fish-oil soaps into this market would be by having performance tests conducted by a cement laboratory regularly inspected by the U.S. Bureau of Standards. Satisfactory performance in these tests would open the way to evaluation of fish oil products by the U.S. Bureau of Public Roads and by the various state highway departments.

The market for air-entraining agents for concrete could serve the fish oil industry in the following ways: (1) to broaden the base of the fish-oil market and act as an aid in buffering against price drop such as was experienced in 1962, (2) to utilize soap stocks resulting from alkali refining of fish oil, and (3) to provide an improved market for stearine obtained in the cold pressing of the oil.



Inventions

NEW FISHING REEL WITH "HYDRAULIC" BRAKE PATENTED:

The drag on a new fishing reel is provided by a manually operated recirculating hydraulic pump in place of the conventional friction brake. The drag is adjusted by regulating the flow between the input and output side of the pump. The inventor claims that the device requires no maintenance over a long life period. It is made of metal or plastic and said to be simple, reliable, and inexpensive. (Patent Number 3,034,604, U. S. Patent Office Classification Number 188-90, granted Stanley B. Holmes, 1126 19th St., Santa Monica, Calif.)

* * * * *

NEW PLASTIC COATING FOR FISH LURES PATENTED:

A new patented fish lure accessory consists of narrow strips of adhesive coated plastic sheet material that can be applied to any conventional lure. The inventor claims that it can be made in any color, is waterproof, and does not affect the action of the lure. The adhesive portion has a backing material which is peeled off prior to use. The plastic material can be made in long sheets that can be folded or rolled. Suitable portions for various lures are then simply torn off. (Patent Number 3,021,632, U. S. Patent Office Classification Number 41-10, granted Leslie J. Gombar, 12591 Glenfield, Detroit 13, Mich.)



Irradiation Preservation

MULTIPLE-IRRADIATED HADDOCK FILLETS EVALUATED FOR QUALITY:

To determine if treating fresh skinless haddock fillets with multiple doses of ionizing radiation at a ten-day interval affects the organoleptic quality, experiments have been conducted by the U.S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass.

Initially, skinless haddock fillets were irradiated at dose levels of 50,000, 150,000, and 250,000 rads.^{1/} At the end of ten days storage at 33° F., the fillets were again irradiated with two additional series of dosages.

Difference tests were conducted on the fillets immediately following the final application of irradiation, and at ten-day intervals thereafter for a period of 30 days.

The difference tests indicate that haddock fillets receiving multiple dosages can be held

PROPOSED FISHERY PRODUCTS IRRADIATOR PILOT PLANT

COBALT⁶⁰ SOURCE

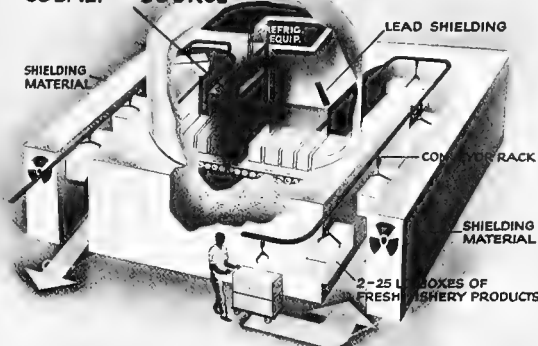


Fig. 1 - Drawing of the proposed marine products irradiator scheduled to be constructed in Gloucester, Mass., by the Atomic Energy Commission and operated by the Bureau of Commercial Fisheries personnel.

at storage temperature of 33° F., without spoilage, for 30 days. There was not signifi-

RADIATION PRESERVATION OF SEAFOOD

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF COMMERCIAL FISHERIES

FRESH SEAFOOD ON ICE
WILL KEEP ABOUT 14 DAYS

IRRADIATION
WILL DOUBLE THIS
KEEPING TIME AND
INCREASE
FRESH FISH SALES

HIGH QUALITY
FRESH FISH
WILL REACH



INLAND MARKETS

COOPERATIVE RESEARCH INDUSTRY GOVERNMENT-INDUSTRY STUDIES

TECHNOLOGICAL RESEARCH
WILL ENABLE YOU TO EXTEND YOUR
MARKETS FOR FRESH FISH BY

- selecting suitable species
- determining optimum radiation levels
- establishing maximum storage time at different storage temperatures
- providing for FDA wholesomeness clearance
- testing and selecting packaging materials
- conducting economic feasibility analysis

Fig. 2 - Exhibit demonstrating the usefulness of radiation preservation of seafood.

cant difference in the scores after 10 and 20 days of storage.

1/Rad=The quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest.

Note: See Commercial Fisheries Review, February 1962 p. 43.

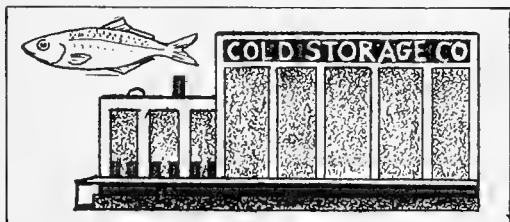


Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SPRING 1963:

The United States domestic catch of fish and shellfish during 1962 amounted to 5.2 billion pounds with an ex-vessel value of about \$385 million, up 2.0 percent in quantity and 5.8 percent in value from the catch in 1961. Fish and shellfish for human consumption comprised about 2.6 billion pounds of the 1962 catch, up slightly from 1961. The remainder was used for the manufacture of industrial products, bait, and animal food. The 1962 catch was the second largest domestic catch, being surpassed only by the record catch of 5.3 billion pounds in 1956.

Supplies of fish and shellfish during the early spring months of 1963 should be slightly more plentiful than in the



comparable 1962 period because of larger frozen inventories. Cold-storage holdings of edible fishery products on January 1, 1963, totaled 218.1 million pounds, about 33.1 million pounds more than a year earlier. Adequate stocks of most varieties of canned fishery products were on hand at the beginning of 1963. Fresh fish landings which are seasonally light during the winter months should increase with the arrival of spring weather when most commercial fisheries begin full operation.

Imports of most edible fishery products into the United States during 1962 were greater than in 1961. Continued high imports are expected early in 1963. Exports of edible fishery products during 1962 were generally higher than a



year earlier, except for canned and frozen shrimp, canned sardines, and fresh or frozen oysters.

Retail prices of fishery products in 1962 averaged about 4 percent higher than in 1961. They increased during last summer, decreased a little in early fall, then increased again slightly at the end of 1962. Prices should remain at the year-end level during the early spring months of 1963, but probably will soften slightly toward the end of that period.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 1963 issue of The National Food Situation (NFS-103).



National Aquarium

PLANS EMPHASIZE RESEARCH AND EDUCATIONAL ROLE FOR PROPOSED AQUARIUM:

The proposed National Fisheries Center and Aquarium for Washington, D. C., "will emerge as one of the world's foremost aquatic biological research centers as well as providing a self-supporting visitor attraction combining entertainment and education," the Secretary of the Interior stated on December 10, 1962.

His remarks followed several weeks of advance planning and consultation out of which a preliminary picture of the Center is beginning to emerge. Final plans for the Center will take about 18 months to complete and it is estimated 2 years will be required for construction.

The Interior Secretary emphasized that 18 months of engineering and architectural planning will be required even after initial funds have been appropriated for the project authorized by the 87th Congress. Authorized cost of the project is \$10 million, to be amortized over a 30-year period by modest admission charges.

Some suggestions which will be presented to the Center's advisory board, required by the Congressional authorization, were:

1. The Center would display more than 1,000 species of fish, amphibians, and invertebrates in natural surroundings such as huge indoor and outdoor pools providing viewing from different levels, including an undersea panorama. Included in preliminary discussions are provisions for providing a trout

stream, discharging into a bayou accommodating bass, as well as outside facilities for seals, sea lions, walrus, sea elephants, and sea otter. Other specially-designed facilities would be provided for tropical fish.

2. The Fisheries Center will provide unequaled facilities and specimens for aquatic research, which would include studies on genetics and selective breeding, nutrition, marine diseases, experimental ecology, behavior of aquatic organisms, antibiotics produced by marine animals, and new food sources from the sea, all designed to complement research activities of the Department's Fish and Wildlife Service.

Other areas of research will be provided for graduate students in marine subjects, plus provisions for educational motion pictures and seminar rooms to be made available to the public as well as for fisheries groups and meetings.

The Secretary stated he was hopeful that the actual architectural design would be determined by requirements for exhibits, research facilities, traffic patterns, etc. His advisors have been most emphatic on the point that rather than design a building and then fit the exhibits and other facilities into it, the reverse procedure should be utilized for maximum efficiency.



North Pacific Exploratory Fishery Program

ABUNDANCE OF ADULT HAKE AND EFFICIENCY OF PELAGIC TRAWL TO BE INVESTIGATED:

M/V "John N. Cobb" Cruise 58: An investigation of the relative abundance of adult hake and the catching efficiency of the Cobb pelagic trawl was the objective of a cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb which began on February 25, 1963. The area of operations will be in waters between Point Conception, Calif., and Cedros Island, Mexico seaward to about 300 miles.

Prior to departure of the John N. Cobb, cooperating research vessels Black Douglas and Alaska used plankton nets and small mid-water trawls to pinpoint areas having an abundance of hake eggs and larvae. If concentrations of eggs and larvae are found to co-

incide with predicted abundance, the Cobb pelagic trawl will attempt capture of spawning adults at standard stations along California Cooperative Oceanic Fisheries Investigations lines 80 through 120 (Point Conception to San Diego up to 200 miles offshore) as time and weather permit. Effort will be concentrated between lines 80 and 100. In the event that significant numbers of eggs and larvae are not found to coincide with predictions, the station pattern will be altered accordingly.

Whenever relatively large concentrations of adult hake or other pelagic species are encountered, the programmed station pattern will be interrupted to allow simulation of commercial fishing operations employing Cobb pelagic trawls constructed of conventional webbing and unconventional monofilament webbing. In addition, a British Columbia-type herring trawl will be fished to test its efficiency relative to capturing rates of Cobb pelagic trawls.

A recently installed sonic telemeter will be used at all times to determine the depth of the trawls.



Oceanography

COMMERCIAL FISHERIES BUREAU ESTABLISHES OCEANOGRAPHIC INSTRUMENTATION PROGRAM:

An Oceanographic Instrumentation Program was established about the latter part of 1962 at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Washington, D. C.

The four areas of the program are: (1) The coordination of oceanographic instrumentation developments within the Bureau of Commercial Fisheries; (2) development, testing, and evaluation of new instruments for the Bureau, either directly or in cooperation with industry, nonprofit research organizations, other Bureau Laboratories, and Federal and State agencies; (3) effecting liaison with other government Bureaus by participation on panels and committees of the Interagency Committee on Oceanography and other groups concerned with oceanographic instrumentation; and (4) servicing of instruments for the Bureau's Biological Laboratory.

Of the four areas, major effort will be expended in areas (1) and (2). The Bureau's requirements for oceanographic instruments will be continuously reviewed. The program will provide information as to instrumentation developments, and will maintain a compilation of those instruments required for use by Bureau activities. It will recommend priority for allocation of funds, both to meet the requirements and to develop regional instrumentation capability, and will publish newsletters, proposal reviews, and reports necessary to accomplish this. The development functions will be coordinated with those of other agencies. Contracts will be left to industry to develop instruments to meet the specialized requirements of the Bureau, and to aid in extending industry's capabilities to produce instruments for the Bureau and for the oceanographic community in general.

* * * * *

ADDITIONAL OCEANOGRAPHIC INSTRUMENTATION TO BE ADDED TO COAST GUARD VESSELS:

The U. S. Coast Guard is authorized by recent Congressional legislation to conduct oceanographic research from its many facilities--weather ships, ice breakers, offshore towers, patrol cutters, and other coastal installations of the Coast Guard.

The Coast Guard operates 32 vessels which are assigned to Pacific and Atlantic Ocean weather stations. It is planned to outfit those ships with oceanographic instruments for continuous full-scale observations. The Coast Guard cutter Casco, based at Boston, Mass., is the pilot installation. Another installation was completed at the Coast Guard shipyard at Curtis Bay, Md., on December 15, 1962.

Such installations include an oceanographic laboratory, deep-sea oceanographic winch,



The Coast Guard cutter, Casco, one of the vessels on which oceanographic instruments were installed.

wave-height sensor, salinometer, Nansen bottles, surface temperature probes, and other equipment for measuring physical and chemical properties.

The Boston-based Coast Guard cutter Casco will serve as a test for the inaugural program from January 1 through July 1, 1963.

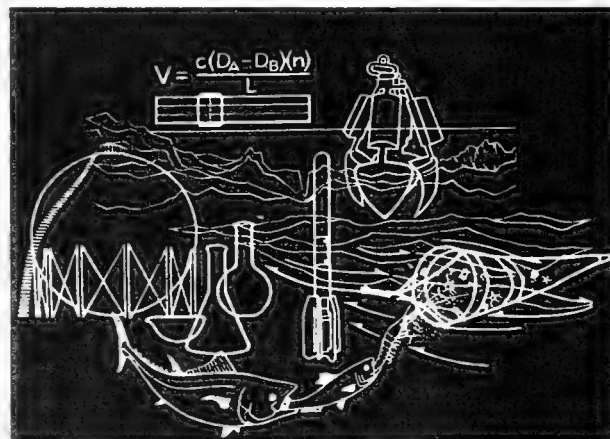
During Fiscal Year 1964, the Coast Guard hopes to outfit 8 to 12 additional weather ships. As new and more modern sensors and equipment are developed they will be added to the weather ships. (National Oceanographic Data Center Newsletter, December 31, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 102.

* * * * *

NATIONAL OCEANOGRAPHIC INSTRUMENTATION CENTER ESTABLISHED:

A new Oceanographic Instrumentation Center at Washington, D.C., was dedicated on January 18, 1963. It is located in the same



Artist's concept of the studies to be aided by the newly established Oceanographic Instrumentation Center.

building as the National Oceanographic Data Center.

The need for better testing and calibrating of oceanographic instruments has been recognized for some time but adequately equipped and staffed facilities have not been available. The Interagency Committee on Oceanography Panel on Instruments and Facilities appointed a Committee to study the need for an Instrumentation Center. The Panel concluded, and it was the recommendation of the Interagency Committee on Oceanography to the Federal Council of Science and Technology, that a test and calibra-

tion facility was definitely needed, if not overdue. The Panel also indicated that because of the anticipated increase in oceanographic work, a facility on both the East and West Coast would ultimately be required. Meanwhile, it was agreed that the Navy Oceanographic Office should establish a Center to function as a prototype for the National facility. The Commander of the U. S. Naval Oceanographic Office was able to obtain funds for the complete renovation of 40,000 square feet of Building 160 at the Naval Station, Navy Yard Annex, Washington, D. C. (formerly the Naval Weapons Plant) into a proper and fully equipped installation. Construction work started in July 1962.

The new Center will provide facilities and staff for carrying out a broad program of development, testing, calibration and evaluation of oceanographic instruments. It will also provide advice and assistance to agencies and activities on oceanographic instrumentation matters as called upon. In addition, the Center will serve as a clearing house for information on the oceanographic instrument development program.

The Center contains engineering facilities for laboratory and contractual development, test and evaluation, and maintenance of instruments. New instruments now under development include improved electronic bathythermographs, shipboard wave recorders, shipboard survey instruments, submerged buoy systems, and sound velocimeters.

To carry out this engineering program, the Center is being equipped with pressure test vessels, shock and vibration test equipment, tensile test facilities, pressure and temperature tanks, additional reversing thermometer calibration equipment, a 60-foot clear water instrument test tower, and a small craft for environment testing in local waters. (National Oceanographic Data Center Newsletter, December 31, 1962.)



Oregon

SCUBA DIVING MORE EXTENSIVELY USED FOR UNDERWATER OBSERVATION:

The increasingly popular sport of SCUBA diving is being more extensively used by personnel of the Oregon Fish Commission. Over

20 staff members are trained in the use of such gear.

SCUBA refers to "self-contained underwater breathing apparatus." The equipment is of the popular navy frogman type--rubber or "wet" suit for insulation, face mask, oxygen tank with breathing tubes, and swim fins. It differs from the diving suits with long air lines extending down from a floating station above the diver, in that the air supply is self-contained and the outfit is much less cumbersome.



SCUBA divers have learned many things about fish and fishing.

SCUBA is applied successfully on a variety of Commission projects where underwater observation is desirable. The initial work was done in connection with fish passage at hydroelectric projects and certain construction works of the Commission. Underwater inspections of the Brownlee Reservoir net on Middle Snake River helped materially in evaluating that controversial fish-collection facility. At Walterville Canal on the McKenzie River and Willamette Falls near Oregon City, Commission divers have taken part in cooperative periodic operations with industry which were designed to move fish past obstructions at critical times. Assistance with the installation of water-control facilities at the outlet works of Wahkeena Rearing Pond in the Columbia River gorge, and of fish racks in hatchery streams are other notable examples where SCUBA diving is being used effectively in Commission programs.

A more recent use of SCUBA diving was in the study of juvenile salmon behavior in reservoirs, conducted early in 1963 in North Fork Reservoir on the Clackamas River, and Lake Simtustus, behind Pelton Dam on the Deschutes River. Because young salmon are generally found in the streams, knowledge of their behavior as they pass through reservoirs seaward is of great importance in evaluating many fish passage problems.

Personnel of the Oregon Fish Commission also used SCUBA gear during the summer of 1962 for underwater observations of spring chinook in the Wilson, Trask, and Salmon

Rivers to gather needed data on location of adult resting pools, determination of juvenile rearing areas, and enumeration of fish seen. Underwater photographs were made during some phases of the work. Spring chinook are found in deep holes during the summer as they wait for fall freshets to signal movement to their spawning beds. Observation from the bank, because of limited visibility, does not give a complete picture of run-size and survival conditions. Juvenile salmon are not readily visible in swift water, thus SCUBA observations are of great value in that type of work.

Another important project was the pilot study of natural rearing of silver salmon in Hall and Schutpeltz Lakes of the Tenmile Lakes system on the southern Oregon coast near Coos Bay. By using SCUBA gear, Commission personnel are learning the habits of planted fry and some of the factors which might limit production in lakes of this type.

Besides the lake and stream work, the Pacific Ocean is explored quite often by marine biologists. Interest in taking red abalone commercially from the southern Oregon coast prompted Commission personnel to observe the abundance of those large shellfish to determine if they occurred in commercial quantities. So far, SCUBA divers have found the relative numbers of abalone, even offshore, not to be of a size sufficient enough to warrant a commercial fishery. SCUBA work has also been done in connection with offshore oil explorations to determine by actual observation of seismic explosions what the effect is on marine life.



Oysters

CHESAPEAKE BAY OYSTER DEATHS DUE TO MSX DECLINED IN 1962:

The head of oyster disease research at the Virginia Institute of Marine Science, told the Fifth Annual Shellfish Mortality Conference on January 29, 1963, that deaths due to MSX declined during 1962 in marginal areas of Chesapeake Bay, although the range of the dreaded oyster disease remained the same as in 1960 and 1961.

"Pocomoke Sound and Bayside of Eastern Shore creeks were replanted without serious losses in 1962," he reported. "The disease decline in these areas may be due to the loss

of large beds in adjacent areas which sustain the concentration of the disease and enable its reinfestation into the marginal areas."

He indicated that incidence and mortality continued at high levels in Mobjack Bay and at Tillage's ground just above York River Bridge in 1962. He added that tray oysters suspended in the York off the Institute's pier showed variable but mostly light MSX activity, and late summer infections formerly noted failed to occur among those oysters in 1962.

In the James River, MSX declined from a level of 30 to 40 percent in late fall and winter to zero incidence in late April 1962, according to the Virginia scientist. New infections were scarce in the summer of 1962, and incidence remained low as late as December 1962. James River seed, including Brown Shoals, is essentially free of MSX infections for the 1962-1963 planting season.

"There is strong indication that decimation of oysters in Hampton Roads by MSX has affected setting in the James River seed area," he stated. "Spatfall was extremely light in James River for 1961 and 1962. This may be due to the depletion of oysters at Hampton Roads, which in turn may be brood stock for the James River seed."

It was pointed out that significant planting has not occurred this year in Chesapeake Bay, Hampton Roads, the lower York River, and the lower Rappahannock River. Production, yields, and profits have been excellent in the low-salinity areas above these infested sections. Use of limited quantities of MSX-infected seed in low salinity planting areas has caused no known losses. Commercial oystering continues on seaside of Virginia's Eastern Shore with few losses to MSX, and future prospects appear excellent.

Discussing other oyster diseases, the scientist indicated that the fungus parasite *Dermocystidium* was absent from Mobjack Bay and the lower York River, although it remains active in all high salinity areas where populations of oysters exist.

The conference on shellfish diseases was held at the Oxford, Md., Laboratory of the U. S. Bureau of Commercial Fisheries from January 28 to 30, 1963. Biologists and research administrators from marine laboratories along the Atlantic, Pacific, and Gulf coasts meet annually in that conference to

consider problems as associated with the recognition, study, and control of oyster diseases.



Pollution

MARINE SCIENTIST DISCUSSES PESTICIDES:

The conflict between various resource interests over the use of chemical pesticides was recently pointed out by a scientist who is in charge of the Ecology-Pollution Department of the Virginia Institute of Marine Science.

Speaking at Gloucester Point, Va., January 23, 1963, he said, "There are over 12,000 brand name formulations of more than 200 basic chemical pesticides on the market today, and over a billion pounds of the products are sold annually. These include insecticides, herbicides, fungicides and nematocides... . Insects are perhaps man's greatest challenge on earth. Of the 2 million or more species, less than 10,000 are considered injurious, but these inflict an estimated 4 billion dollars worth of damage in the United States annually. Also, control procedures must frequently be changed because the insect pest has developed a resistance to the older insecticide."

But he pointed out that the potent chemicals in use today destroy beneficial species as well as pests. Frequently it is necessary to apply chemical agents over large areas to control an invasion of a pest species. The effective life of different control agents may vary from a few days to a decade or more. Insecticides may be washed off the treated areas and destroy aquatic resources. In many areas during the 1950's, some of the most toxic and long-lived insecticides were employed in salt-marsh mosquito and sand fly control programs. The result was wholesale destruction of marine life. Warm-blooded animals including man are not immune to the toxic effects of the chemical agents.

Emphasizing the need for discretion and serious thought in regard to pesticide applications in order to restrict the damage and to prevent future problems and hazards, he said, "The Institute is aware of the necessity for the use of pesticides for the efficient production of farm, garden, and aquatic food products. We do, however, urge that all the

available knowledge be utilized in reaching decisions that may have an affect on other natural resources. It should be further understood that in many cases we do not have knowledge complete enough to make really careful decisions. Thus, more research and a cautious attitude is necessary... . Costs cannot be the major deciding factor in pesticide applications."

Discussing the prospect of eliminating the problems caused by insecticide use, he said that research on biological controls and resistant species must be accelerated. The necessity for chemical control will persist, but additional information about the effect of pesticides on the total environment can reduce damage to non-pest organisms.

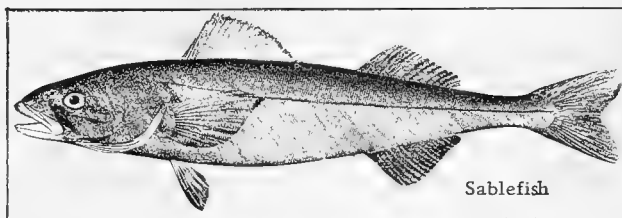


Sablefish

SABLEFISH TAGGED IN WASHINGTON STATE RECOVERED BY JAPANESE VESSELS:

Japanese fishing vessels operating in the Bering Sea in 1962 caught three sablefish tagged and released in Washington State coastal waters in 1955 and 1956. Recovered in the vicinity of the Pribilof Islands, Alaska, as nearly as can be determined, the fish had traveled about 2,000 miles. The first fish was taken 6 years and 42 days from the date of its release in Holmes Harbor, Wash. The second fish roved the North Pacific for 7 years and 53 days before being captured, while the third fish was out 6 years and 101 days.

The fish were tagged with both Peterson and spaghetti tags. The yearly rate of growth



for the two sablefish for which there was complete data was just over 3 centimeters.

Washington State biologists tagged 890 sablefish in 1955 and 659 sablefish in 1956. A total of 143 sablefish tagged in those years have been recovered, mainly in coastal waters of Washington State and British Columbia, Canada.

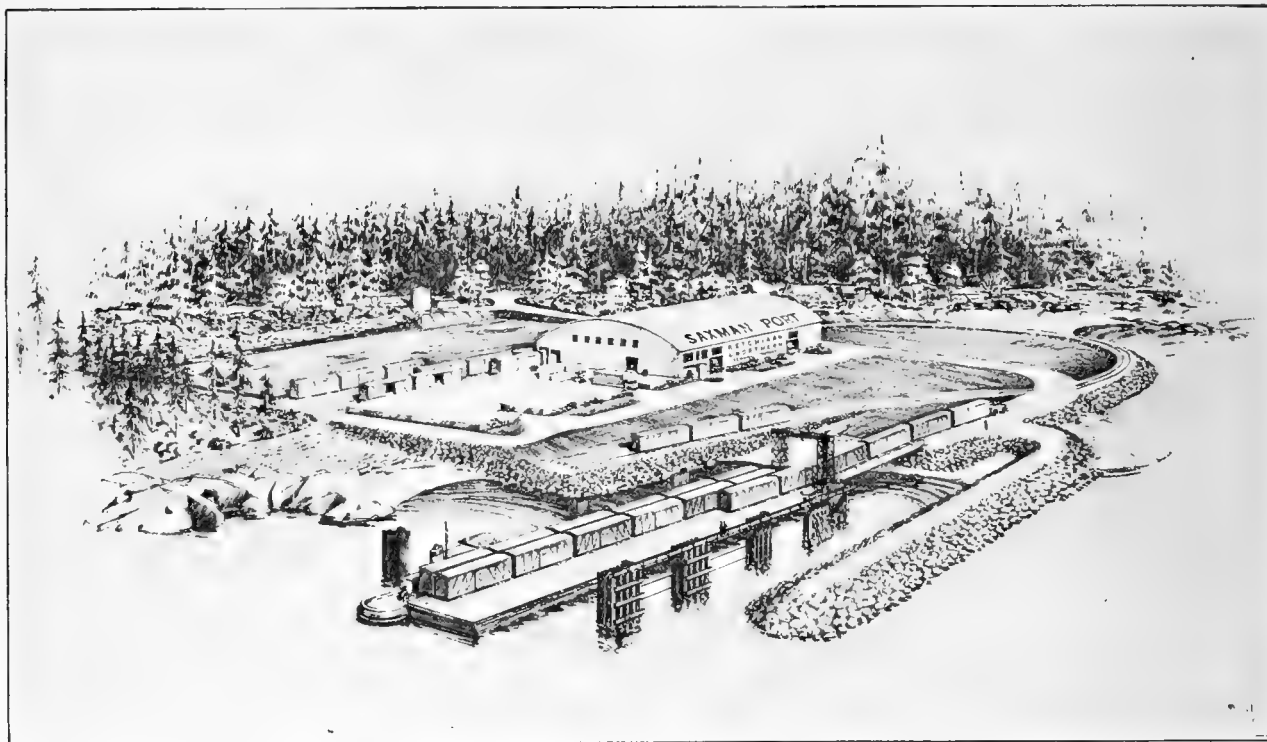


Transportation

NEW RAIL-BARGE FREIGHT SERVICE TO S. E. ALASKA VIA PRINCE RUPERT, B. C.:

A new freight terminal began operating in Saxman, Alaska (near Ketchikan), the latter

Shipments by United States suppliers to the Saxman terminal of less than carload weight will be billed to Chicago, Ill., for consolidation to carload lots and movement to Prince Rupert, B. C., by rail. According to reports, the new Saxman service will reduce freight



Artist's drawing of freight terminal in Saxman, Alaska.

part of February 1963. The terminal has truck and ferry connections to all cities in Southeastern Alaska. Rail connections to the lower 48 States are provided by a barge service between Saxman, Alaska, and Prince Rupert, B. C. The barge, which has a capacity of 20 carloads, was scheduled to begin once-a-week trips on February 13, 1963. The barge trip takes 11 hours. On arrival at Saxman, freight cars will be switched from the barge to a covered warehouse for unloading and distribution.

Distribution from the warehouse will be made by truck using the new Alaska Ferry System to all cities in Southeastern Alaska, and including Wrangell, Juneau, Petersburg, Sitka, Haines, and Skagway. Charges for warehouse handling and distribution to ultimate destination were under consideration and were to be furnished before operation started.

costs (estimated to average 40 percent) between Southeastern Alaska and those United States points which now have parity rates to Prince Rupert, B. C., versus Seattle, Wash.

The Saxman terminal was built with the assistance of Area Redevelopment Administration funds.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, JANUARY 1963:

Item and Period	1963	1962	1961	1960	1959
..... (1,000 Lbs., Heads-Off)					
Total landings, So. Atl. and Gulf States:					
March	-	3,317	4,754	4,098	2,950
February	-	4,125	3,910	3,785	3,227
January	5,000	3,828	5,686	5,401	4,310
December	-	8,530	6,538	7,097	8,716
January-December ..	-	105,100	91,396	141,035	130,659

(Table continued on following page.)

Item and Period	1963	1962	1961	1960	1959
..... (1,000 Lbs., Heads-Off)					
Quantity canned, Gulf States ^{1/} :					
March	-	94	38	128	93
February	-	263	98	223	135
January	510	536	199	289	308
December	-	2,050	889	977	1,278
January-December ..	-	25,277	15,793	28,594	24,679
Frozen inventories (as of end of each mo.) ^{2/} :					
March 31	-	16,607	31,345	23,232	24,893
February 28	-	19,012	37,612	29,063	27,555
January 31	-	21,328	37,842	34,332	30,858
January 1	31,577	28,372	19,755	40,913	37,866
November 30	-	27,500	20,668	37,264	37,334
October 31	-	21,315	17,811	31,209	33,057
September 30	-	12,843	13,361	24,492	26,119
Imports ^{3/} :					
March	-	9,658	10,347	8,545	8,492
February	-	10,599	8,932	7,657	7,481
January	4/	12,907	12,338	8,596	8,238
December	-	15,798	15,442	12,411	10,611
January-December ..	-	141,384	126,268	113,418	106,555
..... (c/lb., 26-30 Count, Heads-Off)					
Ex-vessel price, all species, Gulf Ports:					
March	-	80.9	56.0	56.3	67.6
February	-	78.9	53.5	51.8	69.6
January	5/86-93	76.3	52.5	49.4	70.9
December	-	77-90	75.2	54.2	48.4
November	-	78-93	73.5	54.0	46.2
Aug., Sept., & Oct. ..	-	88-100	68.3	52.4	45.8
May, June, & July ..	-	83.1	54.5	58.1	54.0
Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:					
March	-	94-95	69-71	65-68	81-85
February	-	93-95	69-71	65-67	82-87
January	102-106	91-94	69-71	64-66	86-88
December	-	101-109	91-92	68-70	64-66
November	-	105-110	89-92	69-73	60-65
Aug., Sept., & Oct. ..	-	108-118	76-91	64-73	59-64
May, June, & July ..	-	96-104	67-75	72-77	62-76

1/ Pounds of headless shrimp determined by multiplying the number of standard cases by 33.

2/ Raw headless only; excludes breaded, peeled and deveined, etc.

3/ Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/ Not available.

5/ Range.

Note: Data for 1963 and 1962 are preliminary. January 1963 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, 1962:

United States commercial fishery landings in 1962 reached a near record of 5.2 billion pounds with an ex-vessel value of \$385 million. The value was \$12 million more than the previous record set in 1958, and \$23 million above the 1961 value. Shrimp was again in first place as the most valuable single fishery.

According to statistics compiled by the U. S. Bureau of Commercial Fisheries, the 1962 landings were below the record of 1956, but somewhat higher than in 1961. Although the increase in domestic landings and in imports of edible fishery products brought the total supply of fresh, frozen, and canned products up to the highest point in history, the United States per capita consumption remained at 10.7 pounds, the same as in 1961. This is attributed primarily to the increase in population, and gains in stocks of frozen and canned fish.

United States Commercial Fishery Landings of Certain Species, 1962 and 1961		
Species	1/1962	1961
..... (1,000 Lbs.) ..		
Anchovies	2,600	7,712
Cod, Atlantic	47,000	46,591
Crabs:		
Blue	146,600	152,758
Dungeness	8,500	4,592
King	50,000	43,412
Haddock	134,100	133,597
Halibut ^{2/}	39,900	40,024
Herring:		
Maine	158,000	54,463
Alaska	32,000	49,465
Industrial fish, Maine & Mass. ^{3/}	42,700	42,200
Mackerel:		
Jack	90,900	97,606
Pacific	44,600	44,110
Menhaden	2,236,300	2,314,677
Ocean perch, Atlantic	122,500	132,062
Oysters, all species	56,000	62,300
Pollock	17,100	21,406
Salmon	315,000	310,412
Sardines, Pacific	14,800	43,169
Scallops (meats)	24,100	27,461
Shrimp (heads-on)	190,600	174,494
Tuna	307,300	325,804
Whiting	86,100	100,729
Total all above items	4,166,700	4,229,044
Other ^{4/}	1,071,300	954,956
Grand Total	5,238,000	5,184,000

1/ Preliminary.

2/ Dressed weight.

3/ Excludes menhaden.

4/ Includes landings for species not listed.

Note: Fish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

The major part of the 1962 landings consisted of industrial or non-food fish. Industrial fish landings were 2,661 million pounds, 84 million pounds more than the food-fish landed during the year.



Heading of shrimp aboard a fishing vessel.

The 1962 herring landings by Maine fishermen were far short of a record but were nearly three times the 1961 total. Landings of king crab caught off the coast of Alaska set a record of 7 million pounds more than the previous year. North Atlantic groundfish landings were lower in 1962. Cod and haddock landings were about the same as in 1961 but ocean perch and pollock declined from the previous year.

Landings of Pacific sardines dropped sharply in 1962 while shrimp landings were 17 million pounds more than in 1961.

The 1962 salmon pack was slightly lower than in 1961 but the amount of tuna packed set a new record with one million cases more than the previous year. Domestic tuna landings were somewhat lower than in 1961 but record imports of frozen tuna for canning in United States plants boosted the pack to the new record.



U. S. Fishing Vessels

AUTOMATED STERN TRAWLER-PURSE SEINER "NARRAGANSETT" LAUNCHED:

The launching of the Narragansett on January 10, 1963, at Warren, R.I., gave the United States its first commercial stern trawler. The prime feature of the revolutionary 83-foot vessel is an automated over-the-stern net-handling system. The vessel was



Artist's drawing of the new stern trawler-purse seiner rigged with an automated over-the-stern net-handling system.

also designed for purse seining and scallop dredging. It can be converted to either method of fishing in less than a day. Following her trial runs, the vessel will probably work initially as a trawler.

The Narragansett represents an effort by private industry to meet foreign competition by using the technical know-how of the United States. The vessel was built by a firm of

naval architects and shipbuilders in Warren, R.I. It was the aim of the firm to create a vessel to compete with European vessels from the standpoint of cost as well as efficiency. To achieve their goal, the firm used the latest mechanical equipment and unique methods of vessel assembly.

It is also hoped that the vessel's bad weather fishing ability may lead to a 5-day work-week for the fishermen. This together with good living conditions and improved working conditions should make fishing a more profitable and comfortable occupation for the Narragansett's crew.

Note: See Commercial Fisheries Review, May 1962 p. 32.

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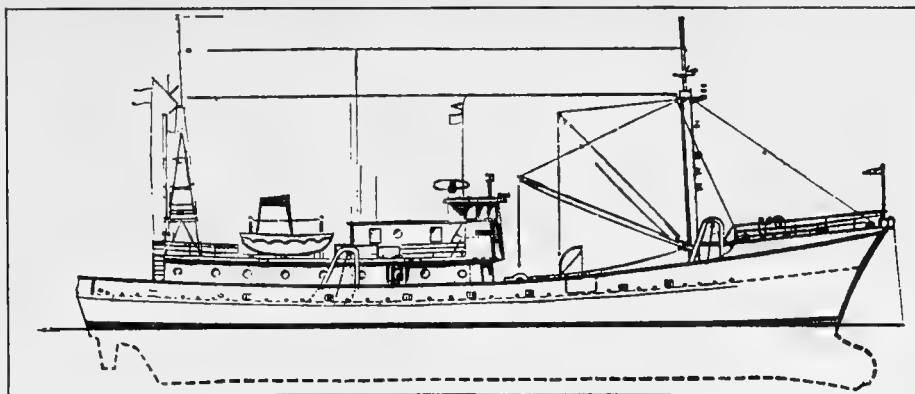
CONTRACT LET FOR NEW PACIFIC OCEAN FISHERY RESEARCH VESSEL:

A \$1,049,935 contract for construction of the M/V Townsend Cromwell, the U. S. Bureau of Commercial Fisheries new combination fishery-oceanographic research vessel, has been awarded to the McDermott Shipyard of Morgan City, La., the Interior Department announced on December 11, 1962. The vessel, to be completed in about a year, will be based in Honolulu, Hawaii.

The vessel is named for the late Townsend Cromwell, a Bureau of Commercial Fisheries oceanographer who discovered what is now known as the Cromwell Current in the Pacific Ocean. This current may be compared to a subsurface river flowing eastward along the Equator.

The Townsend Cromwell will be 158 feet 6-inches long and will have a 33-foot beam. It will have a bulbous bow with viewing ports to permit underwater observation of fish, and cameras will be used to record the behavior of fish for further study.

Shallow draft of the research craft will permit the investigation of coastal areas for tuna bait fish resources. It will carry a variety of winches and other equipment for standard oceanographic work on currents, temperature, and other properties of the sea. A chemical laboratory will facilitate the completion of analysis aboard ship. Other equipment will permit a variety of experimental fishing methods, including the use of long lines, midwater trawls, gill nets, and live bait. The vessel will be operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory in Honolulu.



Outline of the research vessel, Townsend Cromwell, showing the Iniu bulb (under water at the bow) which will increase speed.

Its two Diesel engines, with variable pitch propellers, will permit the wide range of speed necessary for fishery and oceanographic research. Speed can be reduced and maintained at half a knot for plankton net trawling or it can be increased as desired to a 12-knot cruising speed. The vessel will have a range of about 10,000 miles.

The Cromwell Current, which has an estimated volume about 500 times that of the Mississippi River, was discovered in 1952 when Cromwell and others noted that drift buoys with deep drag moved in an opposite direction from those that were strictly surface buoys. The current's core is about 330 feet below the surface and its speed is approximately three knots. Cromwell, a native of Boston, Mass., was killed in 1958 in an airplane crash in Mexico.

SEINE SKIFFS CARRIED ON TUNA PURSE SEINERS NEED NOT BE LICENSED:

The question has arisen as to whether certain boats called "seine skiffs," which are carried aboard large fishing vessels, need to be licensed as fishing vessels of the United States.

The boats in question are described as large, heavily built, flat-bottomed, seine skiffs with straight sides of considerable beam. There are two sizes in general use. One measures 28 feet over-all with a net tonnage of about 7 tons and the other measures 30 feet over-all with a tonnage of about 10 net tons. The skiffs are carried on board large fishing vessels and are used in setting tuna purse seines. The seine skiff is put overboard from the fishing vessel only to hold

the end of the net while it is being set in a circle around a school of fish. The seine skiffs are also used as lifeboats for the fishing vessel.

The U. S. Bureau of Customs, in a January 23, 1963, letter to the Director, U. S. Bureau of Commercial Fisheries, concluded as follows:

"... Since the seine skiffs involved are used only to set the seine nets and are not used in any way with the catching of the tuna, it is the Bureau's opinion that they are not engaged in the fisheries or any other trade. Consequently, there is no affirmative requirement for the documentation of the seine boats described whether or not they measure more than 5 net tons. This decision, however, shall not be construed as a precedent applying to any vessels other than those described.

"The Collectors of Customs at San Francisco, Los Angeles, and San Diego, California, are being notified of the Bureau's ruling in this regard."

WEATHER CONDITIONS REPORTED BY RADIO WHILE ON TUNA FISHING TRIPS:

Four tuna purse-seiners operating out of California fishing ports have been outfitted with radio frequency 8805.6 kilocycles, which will permit them to communicate by voice directly with the U. S. Bureau of Commercial Fisheries radio station located on the campus of Scripps Institution of Oceanography, La Jolla, Calif. The vessels are the Coimbra, Corsair, Jo Linda, and Cylle V. A.

Weather conditions are being reported routinely as the vessels travel to the fishing

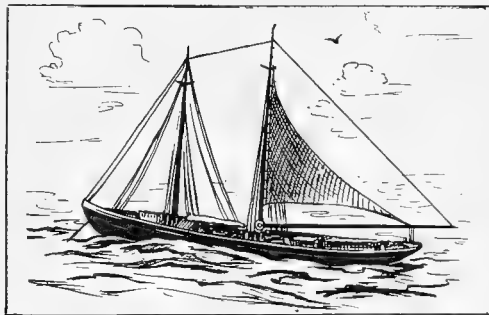
grounds. Temperatures for inclusion in monthly temperature charts are derived from those reports. Plans for collection and radio reporting of additional environmental data such as thermocline depth will be made if the communication system works well.

The U. S. Weather Bureau was unable to get radio reports of weather from tuna vessels in the past because they were often required to wait for extended periods before commercial circuits were clear to take traffic. Because of time lost during those waiting periods, particularly on days of heavy fishing activity, the vessels were reluctant to give weather reports. Activation of the tuna vessel radio frequency now eliminates the waiting time and may stimulate cooperation on the part of all vessels.

* * * * *

DOCUMENTATIONS ISSUED AND CANCELED, DECEMBER 1962:

During December 1962, a total of 12 vessels of 5 net tons and over were issued first



Cod-fishing schooner at anchor.

Table 1 - U. S. Fishing Vessels--Documents Issued and Canceled, by Tonnage Groups, December 1962

Gross Tonnage	Issued ^{2/}	Canceled ^{3/}
.....(Number).....		
5-9	3	5
10-19	3	9
20-29	-	3
30-39	-	1
40-49	4	3
60-69	-	1
70-79	-	1
110-119	1	-
160-169	-	1
250-259	1	-
Total	12	24

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

^{2/}There were no undocumented vessels in December 1962 previously removed from records. Vessels issued first documents as fishing craft were built: 7 in 1962; 1 in 1961; 1 in 1960; 1 in 1956; and 2 prior to 1951. Assigned to areas on the basis of their home ports.

^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

Table 2 - U. S. Fishing Vessels^{1/}--Documentations Issued and Canceled, by Areas, December 1962 with Comparisons^{1/}

Area (Home Port)	December		Total	
	1962	1961	1962	1961
.....(Number).....				
Issued first documents^{2/}:				
New England	1	1	28	33
Middle Atlantic	1	1	3	12
Chesapeake	2	6	43	75
South Atlantic	1	4	47	47
Gulf	4	6	110	100
Pacific	3	2	130	149
Great Lakes	-	-	5	12
Puerto Rico	-	-	2	2
Total	12	20	368	430
Removed from documentation^{3/}:				
New England	4	2	24	20
Middle Atlantic	5	3	39	34
Chesapeake	-	-	23	28
South Atlantic	-	-	38	30
Gulf	6	7	104	103
Pacific	8	7	111	112
Great Lakes	1	-	22	14
Hawaii	-	-	3	-
Puerto Rico	-	-	1	-
Total	24	21	365	341

^{1/}For explanation of footnotes, see table 1.

documents as fishing craft, as compared with 20 in December 1961. There were 24 documents canceled for fishing vessels in December 1962 as compared with 21 in December 1961.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, DECEMBER 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in December 1962 were down 15.4 percent in quantity and 13.5 percent in value from those of the previous month. There was a general seasonal decline in imports in December. Imports were down substantially for groundfish fillets, frozen tuna other than albacore (decline mostly from Peru), canned tuna in brine, and frozen shrimp (decline mostly from Mexico). The decline was partly offset by an increase in imports of swordfish fillets, frozen albacore tuna, canned sardines not in oil (increase mostly from South Africa), and lobsters from Canada.

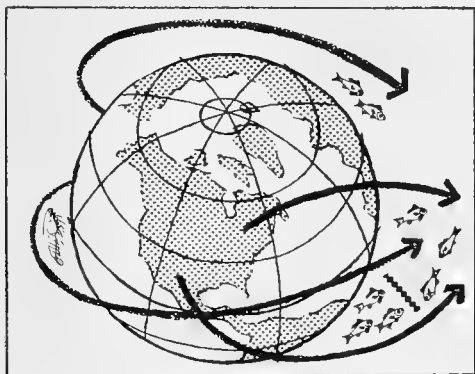
Compared with the same month in 1961, the imports in December 1962 were down 1.0 percent in quantity. The value of the imports in both months was the same. There was a sizable increase in the December 1962 imports of groundfish fillets, frozen tuna other than albacore (increase mostly from Japan and British West Africa), and canned sardines not in oil. But imports were down for frozen albacore tuna (decline mostly from Japan), canned tuna in brine, and canned sardines in oil.

In the year 1962, imports were up 14.0 percent in quantity and 19.1 percent in value as compared to those in 1961. The greater increase in value was because of the higher prices which prevailed in 1962 for most imported fishery products. Most fishery products were imported in greater

quantity in 1962 and imports were up substantially for fish blocks or slabs, frozen tuna (increase mostly from Japan and Peru), canned sardines in oil and not in oil, frozen shrimp, and sea scallops. Imports were down for the following products: haddock fillets, fresh and frozen salmon, canned salmon, canned tuna in brine, canned bonito and yellowtail, and canned crab meat.

U. S. Imports and Exports of Edible Fishery Products, December 1962 with Comparisons								
Item	Quantity				Value			
	Dec.		Jan.-Dec.		Dec.		Jan.-Dec.	
	1962	1961	1962	1961	1962	1961	1962	1961
	. (Millions of Lbs.)				. (Millions of \$)			
Imports:								
Fish & Shellfish								
Fresh, frozen & processed ^{1/} . . .	86.5	87.4	1,169.7	1,026.5	31.3	31.3	397.4	33.8
Exports:								
Fish & Shellfish:								
Processed only ^{1/}								
(excluding fresh & frozen). . . .	4.8	4.6	35.6	28.5	2.1	1.3	16.0	13.4
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.								

Exports of processed fish and shellfish from the United States in December 1962 were up 37.1 percent in quantity and 5.0 percent in value from those in the previous month. In December, there was a large increase in exports of the lower-priced canned mackerel and canned sardines not in oil, as well as a modest increase in exports of canned salmon. But there was a decline in exports of canned shrimp.



Compared with the same month in 1961, the exports in December 1962 were up 4.3 percent in quantity and 61.5 percent in value. A sharp increase in exports of the higher-priced canned salmon in December 1962 was almost offset by a decline in exports of the lower-priced canned squid.

Processed fish and shellfish exports for the year 1962 were up 24.9 percent in quantity and 19.4 percent in value from those in 1961. Exports of the lower-priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines in oil. But there was a small decline in exports of canned shrimp, (decline mostly in exports to Canada and the United Kingdom) and canned sardines not in oil (decline mostly in exports to the Philippines). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty was 59,059,014 pounds (about 2,812,334 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

Imports of tuna canned in brine during January 1-December 31, 1962, amounted to 54,483,996 pounds (about 2,594,476 cases), according to preliminary data compiled by the Bureau of Customs. This was 4,575,018 pounds (217,858 cases) less than the quota. The imports in 1962 were 3.1 percent below the 56,252,179 pounds (2,678,675 cases) imported during January 1-December 30, 1961.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JANUARY 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in January this year rose 0.8 percent from December 1962 due mainly to higher ex-vessel prices for fresh haddock, and an increase in prices for both fresh and frozen shrimp. Severe weather on the New England fishing banks continued to curtail the groundfish landings at Boston, and new supplies of imported frozen shrimp were held up due to labor trouble on the docks. Compared with the same month last year, prices this January were generally higher for fresh and frozen whole and processed fish and shellfish which more than compensated for a moderate decline in canned fishery products prices.

The drawn, dressed, and whole finfish subgroup index in January 1963 was up 3.1 percent from the preceding month and sharply higher (25.1 percent) from January a year ago. Higher ex-vessel prices for fresh haddock on the Boston market were largely responsible for the increase from December 1962 to January this year. From January a year ago to this January, the drawn haddock price increased by



Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Jan. 1963	Dec. 1962	Jan. 1963	Dec. 1962	Nov. 1962	Jan. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.9	120.9	118.3	115.2
Fresh & Frozen Fishery Products:					130.0	127.6	123.7	112.4
Drawn, Dressed, or Whole Finfish:					137.2	133.1	120.8	109.7
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.21	.18	162.9	143.8	87.2	78.1
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.43	.43	128.1	127.1	129.6	110.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.96	.97	134.5	135.2	134.5	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.71	.69	106.0	103.0	100.7	110.5
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.54	.54	88.5	88.5	88.5	92.5
Processed, Fresh (Fish & Shellfish):					130.4	128.5	124.0	117.9
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.57	.58	137.2	139.6	99.6	87.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.09	1.05	127.2	123.1	121.9	110.2
Oysters, shucked, standards	Norfolk	gal.	7.88	7.88	132.8	132.8	130.7	132.8
Processed, Frozen (Fish & Shellfish):					117.5	116.4	120.7	105.5
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	100.1	100.1	103.9	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	107.0	107.0	107.0	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.34	117.5	117.5	118.3	115.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.05	1.03	123.9	122.2	128.7	108.5
Canned Fishery Products:					108.0	109.4	109.4	120.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.75	25.50	107.9	111.1	111.1	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	101.6	101.6	101.6	116.2
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.31	119.4	119.4	119.4	157.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

108.6 percent, frozen dressed halibut rose 16.0 percent, and frozen dressed salmon was up 11.6 percent.

The fresh processed fish and shellfish subgroup index this January increased 1.5 percent from December 1962 and was up 6.0 percent from January a year ago. An increase of 3.3 percent or about 4 cents a pound in fresh shrimp prices at New York City was responsible for the increase in the index from December 1962 to this January. During the same period, prices of fresh haddock fillets at Boston were down slightly and the fresh shucked oyster price was unchanged. As compared with January 1962, haddock fillets this month were higher by 57.0 percent and fresh shrimp prices were up 15.4 percent.

The January 1963 processed frozen fish and shellfish price index rose less than 1 percent from the preceding month because of a 1.4-percent increase in frozen shrimp prices at Chicago. Wholesale prices for frozen fillets

were unchanged from December to January 1963. Compared with the same month a year ago, the January 1963 subgroup index rose 11.4 percent due to higher frozen shrimp prices (up 14.2 percent at Chicago) and an increase in frozen haddock fillet prices (up 10.7 percent at Boston). During the same period, prices for frozen ocean perch fillets increased about 1/2 cent a pound.

From December 1962 to this January the canned fishery products subgroup index declined 1.3 percent because of lower prices for canned pink salmon. The 1962 pack of canned pink salmon was much higher than the previous year and a downward price revision for the year's pack was not unexpected. Compared with January a year ago, the canned pink salmon price index this January was lower by 11.6 percent. Lower prices this January for canned Maine sardines (down 2.4 percent) and other items in the subgroup resulted in a 10.3 percent drop from January a year ago.



As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



International

EUROPEAN ECONOMIC COMMUNITY

FISHERIES POLICY CONFERENCE POSTPONED:

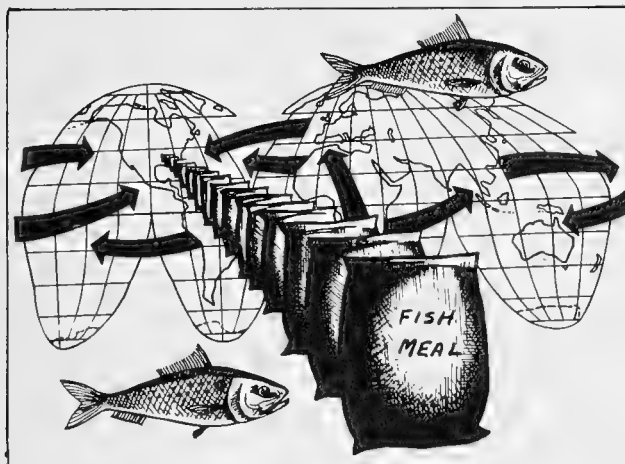
The European Economic Community (EEC) fisheries policy conference, first scheduled for early in the fall of 1962, and later set tentatively for January 23, 1963, has been re-scheduled again, according to a January 3 report from the Brussels correspondent of a large newspaper in Copenhagen, Denmark. The EEC Commission set no new date or place for the conference because of the press of other meetings. It was hoped, however, that the Ministers of Agriculture, under whom fisheries matters come, might agree to hold the conference in late February 1963 in Brussels, Belgium. (Regional Fisheries Attache for Western Europe, United States Embassy, Copenhagen, January 3, 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 65, August 1962 p. 51.

FISH MEAL

WORLD PRODUCTION, NOVEMBER 1962:

World production of fish meal in November 1962 was 19.0 percent greater than in the same month of 1961, ac-



cording to preliminary data from the International Association of Fish Meal Manufacturers. World production during the first 11 months of 1962 was reported as 2,001,902 metric tons.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

World Fish Meal Production by Countries, November 1962

Country	November		Jan.-Nov.
	1962	1961	1962
.... (Metric Tons)			
Canada	2,193	4,582	67,025
Denmark	4,139	2,639	88,927
France	1,100	1,100	12,100
German Federal Republic ..	4,803	5,535	66,801
Netherlands	1/	900	1/ 4,300
Spain	2,055	2,238	23,780
Sweden	709	616	4,467
United Kingdom	5,508	5,150	67,704
United States	9,999	9,135	259,410
Angola	4,375	2,745	29,050
Iceland	1,218	1,539	93,980
Norway	9,131	9,255	116,370
Peru	145,543	114,541	965,181
South Africa (including South-West Africa)	800	1,000	202,807
Total	191,573	160,975	2,001,902

1/Data available only for January-October 1962.

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present

The increase in world fish meal production in November 1962 was due mainly to greater output in Peru. World fish meal production during the first 11 months of 1962 was increased by heavier landings of anchoveta in Peru, record landings of pilchards in South Africa, record landings of summer herring in Norway and Iceland, and increased landings of industrial fish in Denmark.

Peru accounted for 76.0 percent of world fish meal production (for countries listed) in November 1962.

During the first 11 months of 1962, Peru accounted for 48.2 percent of total fish meal production, followed by the United States with 13.0 percent and South Africa with 10.1 percent.

* * * * *

FISH MEAL EXPORTS AND PRODUCTION FOR SELECTED COUNTRIES, JANUARY-OCTOBER 1962:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland,

International (Contd.):

Norway, Peru, and South Africa/South-West Africa.

Production and Exports of Fish Meal by Member Countries of the Fish Meal Exporters' Organization, January-October 1962				
Country	October 1962		Jan.-Oct. 1962	
	Production	Exports	Production	Exports
Angola	4,780	4,437	24,666	25,229
Iceland	357	2,421	92,762	59,012
Norway	11,932	6,774	107,239	41,082
Peru	92,353	63,337	819,338	893,865
South Africa (including So.-West Africa) . .	2,550	10,280	200,419	171,961
Total	111,972	87,249	1,244,424	1,191,149

In January-October 1962, Peru accounted for 75.0 percent of total fish-meal exports by FEO countries, followed by South Africa with 14.4 percent, Iceland with 5.0 percent, Norway with 3.5 percent, and Angola with 2.1 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 16, 1963.)

FOOD AND AGRICULTURE ORGANIZATION

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH MEETS IN ROME:

The new Advisory Committee on Marine Resources Research of the Food and Agriculture Organization (FAO) held its first meeting at FAO's Rome, Italy, headquarters, January 28-February 2, 1963.

The committee reviewed the FAO Fisheries Division's present work in marine resources research and discussed the draft program for 1964/65.



Established in October 1962, the Committee meets once a year and reports its findings to FAO's Director-General.

The Committee is made up of not more than 15 experts from various countries appointed for one-year terms by the Director-General. They have been selected on the basis of their expert knowledge and not as representatives of their governments.

In addition to its FAO role, the Committee will also act as the advisory group on oceanographic aspects of fisheries to the Intergovernmental Oceanographic Commission under the United Nations Education,

Scientific, and Cultural Organization (UNESCO). For this purpose two fisheries scientists from the Soviet Union will be added to the Committee.

Among the 13 members of the Advisory Committee on Marine Resources are two from the United States: Dr. Vernon E. Brock, Laboratory Director, Bureau of Commercial Fisheries Biological Laboratory, U. S. Department of the Interior, Washington, D. C.; and Dr. Wilbert McLeod Chapman, Director, Van Camp Foundation, California.

* * * * *

WORLD TRADE IN FISHERY PRODUCTS REACHES NEW HIGH IN 1961:

International trade in fishery products reached a new high of 4.3 million metric tons and an estimated value of US\$1.3 to 1.4 billion in 1961, according to figures released by the Food and Agriculture Organization (FAO) late in 1962. The 1961 international trade increased by some 250,000 tons and \$50 million over 1960.

About 11.8 million tons of fish as they came out of the water were used to produce the products that entered international trade. That means that one-third of the catch in 1961 for the 127 countries submitting both catch and international trade statistics went into products for international trade. For those same countries, the catch was 35.7 million tons, or 87 percent of the total world catch.

FAO has reported the 1961 world catch at 41.2 million tons. This figure, however, includes FAO's estimate of the catches of countries which did not submit international trade statistics, including mainland China, whose catch alone is estimated at 5 million tons.

Note: A copy of Yearbook of Fishery Statistics, 1960/61, International Trade, Vol. XIII, may be obtained from the Sales Agent for FAO Publications, International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y. The price is \$5.00.

INTERNATIONAL LABOR ORGANIZATION

WORKING CONDITIONS IN FISHING INDUSTRY REVIEWED:

Working conditions in the world's fishing industries were discussed by a special 18-man Technical Committee of the International Labor Organization (ILO) at a 10-day meeting at Geneva, Switzerland, that ended December 18, 1962. Fishing vessel crew ac-

International (Contd.):

commodations and safety, accident insurance, vocational training, and certificates of competency were considered at the meeting in order to lay the groundwork for possible international conventions on those subjects. The Committee recommendations to the ILO will later be considered by the International Labor Conference which is the periodic meeting of delegates from 104 nations, including the United States, to discuss world labor problems.

The special Technical Committee has 18 members, six each from labor, management, and government, selected from various member nations of ILO. At the Geneva meeting, Thomas Rice, Assistant to the Commissioner of the U. S. Fish and Wildlife Service, served as a Government representative and Charles Jackson, Legislative Counsel of the National Fisheries Institute, served as an employer representative from the United States.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1963:

Fishing for halibut will begin May 9 (at 6 p.m.) in all North Pacific areas (Areas 1, 2, and 3A) except in Bering Sea (Area 3B North) and waters west of the Shumagin Islands (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1963 fishing season. The regulations this year do not differ substantially from those for 1962.

March 25 will be the opening date for fishing in Area 3B North and April 19 the opening date in Area 3B South. This year fishing will begin on the same dates as last year in all Areas, except Area 3B North. Last year Area 3B North was opened to fishing March 28, three days later than the opening date this year.

Fishing areas shall be: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North--waters in Bering Sea.

The opening and closing hours of the various regulatory areas shall be 6 p.m. Pacific standard time of the date indicated.

In Area 1 the fishing season, with no catch limit, shall terminate at the same time as that in Area 2. (Last year Area 1 was open to fishing to September 8 or to the date on which Area 2 closed.)

In Area 2 the fishing season shall terminate at the time of attainment of the catch limit of 28 million pounds (the quota is the same as last year and also 1961).

In Area 3A the fishing season shall terminate at the time of attainment of the catch limit of 34 million pounds, which is one million pounds more than last year.

In Area 3B South the fishing season, with no catch limit, shall end September 30 or at the closure of Area 3A, whichever



Dressed halibut are stored in ice in the hold.

ever is the later (the closing date last year was 6 p.m. on September 30).

In Area 3B North the fishing season, with no catch limit, shall end October 15 or at the closure of Area 3A, whichever is later (last year Area 3B North was open to fishing to October 15).

The Commission will provide 10 days notice of closure of Areas 1 and 2, and 18 days notice of the closure of Area 3A as it did in 1962.

The Commission's recommendations for the 1963 season were announced on January 31 at the conclusion of its thirty-ninth annual meeting at Petersburg, Alaska, with Chairman Harold W. Crowther of Washington, D. C., presiding.

Other members of the Commission are Mattias Madsen and William A. Bates, representing the United States; and Dr. William Sprules (Vice Chairman), Harold S. Helland and Richard Nelson, representing Canada.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulation are based upon the findings of its scientific staff.

During the past 31 years of Commission management, there has been progressive improvement of the stocks and increase in annual yield. The annual catch, which had declined to 44 million pounds in 1931 the year before regulation, has averaged 72 million pounds during the past four years. The 1962 catch of nearly 75 million pounds was worth over \$22.5 million ex-vessel. The 1962 catch and value are all-time records.

The Commission reviewed the past year's fishery and the research conducted by its scientific staff. It also dealt with administrative matters and approved a research program for 1963. In the course of its sessions the Commission conferred not only with its staff, but also with representatives of the halibut fishermen's, vessel owners', and dealers' organizations. The scientific findings and all suggestions for regulations in 1963 were discussed at meetings.

The Commission announced also that the 1964 annual meeting will take place at Seattle, Wash. The date was not specified. The annual meeting this year was the first held in Alaska.

Dr. William M. Sprules of Ottawa, Ont., was elected Chairman and Harold E. Crowther of Washington, D. C., Vice Chairman for the ensuing year.

International (Contd.):

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain the 1963 regulations as recommended by the Commission will be approved by the two Governments.

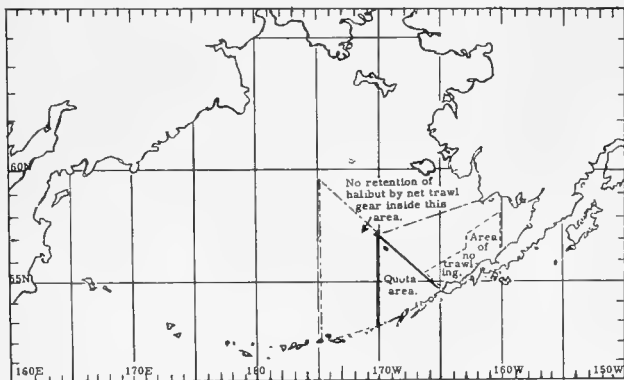
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CONSERVATION RECOMMENDATIONS FOR HALIBUT OF EASTERN BERING SEA:

At its Ninth Annual Meeting, held in Seattle, Wash., in November 1962, the International North Pacific Fisheries Commission determined that the halibut stock of the eastern Bering Sea no longer meets the conditions of Article IV of the International Convention for the High Seas Fisheries of the North Pacific Ocean and recommended to the Contracting Parties that this stock of halibut be removed from the list of stocks under abstention as described in the Annex to the Convention.

At its Ninth Annual Meeting the Commission also agreed to hold an interim meeting in Tokyo, beginning on February 5, 1963, for the purpose of developing recommendations for conservation measures for halibut to be applied to the fisheries of the eastern Bering Sea at such time as the Contracting Parties approve the Commission's recommendation that halibut of the eastern Bering Sea be removed from abstention.

At the interim meeting each national section of the Commission expressed fully its views on necessary and appropriate conservation measures for the stock and area in question. In view of the results of research now available and taking into consideration the fact that the United States and Canada have long taken measures for the conservation of halibut in the eastern Bering Sea on the recommendation of the International Pacific Halibut Commission, the International North Pacific Fisheries Commission respectfully recommends to the governments of the Contracting Parties the following measures for the conservation of halibut in the



eastern Bering Sea. These measures will be required for the purpose of halibut conservation at such time as all the Contracting Parties accept the Commission's recommendation that halibut of the eastern Bering Sea be removed from the Annex to the International Convention for the High Seas Fisheries of the North Pacific Ocean:

1. That the area within which these joint conservation measures shall apply is that portion of the Bering Sea lying east of the meridian of 175° W. longitude.
2. That the period within which these measures shall apply is from 0000 hours on March 25, 1963, to

2400 hours on March 24, 1964. All times mentioned shall be local standard time.

3. That no halibut of length less than 66 centimeters (26 inches), as measured from the tip of the lower jaw to the extreme end of the middle of the tail, or halibut which, with the head off and entrails removed, are less than 2.25 kilos (5 pounds) in weight may be retained at any time by any fishing vessel of any of the Contracting Parties.
4. That nothing within any of these recommendations shall apply to or restrict the operations of a bona-fide research vessel under the direct control of a Contracting Party.
5. That within the joint conservation area the opening date for the retention of halibut by any fishing vessel of any of the Contracting Parties shall be 1800 hours, March 25, 1963.
6. Outside the triangular area as defined in item 7, fishing vessels of any Contracting Party shall not retain any halibut captured after 1800 hours on October 15, 1963, except as stated in item 8 below.
7. That within the triangular area bounded by a line connecting Cape Navarin and the northern tip of Cape Sarichef, Unimak Island; the meridian of 170° W. longitude; and the Aleutian Islands; (a) the catch quota for halibut for the 1963 season shall be 11,000,000 pounds or 5,000 metric tons to be computed with heads off and entrails removed, (b) fishing vessels of any Contracting Party shall not retain any halibut captured after 1800 hours on the date the catch quota has been reached or after 1800 hours on October 15, 1963, whichever is earlier.
8. That, outside of the triangular area defined in item 7 above, linefishing vessels may retain incidentally-caught halibut at a ratio of one pound of halibut for each seven pounds of other species until 1800 hours, November 15, 1963.
9. All vessels employing any type of net trawl gear shall return to the sea immediately any halibut taken within an area bounded by the meridian of 175° W. longitude; the Aleutian Islands and the Alaska Peninsula; a line from Cape Newenham to the intersection of a line from Cape Navarin to the northern tip of Cape Sarichef on Unimak Island with the meridian of 170° W. longitude, and a line from this point to the intersection of the meridian of 175° W. longitude with the line from Cape Navarin to the northern tip of Cape Sarichef on Unimak Island.

The Commission takes note, in relation to the above recommendations for conservation measures in the eastern Bering Sea, that the Government of Japan, as a domestic measure in 1963, intends to prohibit trawling of all kinds in an area defined as follows:

An area delimited by the line of 160° W. longitude; a line connecting the point of 58°10' N. latitude, 160° W. longitude, and the point of 57°10' N. latitude, 163° W. longitude; the line of 163° W. longitude; a line running from the point of 56°20' N. latitude, 163° W. longitude, through the point of 56° N. latitude, 164° W. longitude, to its intersection with a line connecting Cape Navarin of the U.S.S.R. and the northern tip of Cape Sarichef, Unimak Island; a line connecting Cape Navarin and the northern tip of Cape Sarichef; the Aleutian Islands; and the Alaska Peninsula.

This action by Japan will, to a great extent, afford protection for the young juvenile halibut known to be concentrated in the region.

The Commission also notes that, in relation to the above recommendations, the Government of Japan intends to estab-

International (Contd.):

lish for 1963 a minimum size limit of 66 centimeters for retention of halibut throughout the Bering Sea.

Further, the Commission records that it is developing a research program to provide information which will extend and improve the scientific basis for the conservation of the groundfish of the Bering Sea.

MARINE OILS

ESTIMATED WORLD PRODUCTION, 1955-63:

World production of marine oils (including whale and sperm-whale oils, and fish and fish-liver oils) in 1963 is expected to be down at least 3 percent from the partially estimated production of 1962. A reduction in whale-oil production is anticipated for the 1962-63 Antarctic season as well as a moderate reduc-

participants from the many countries interested in the fisheries and marine researches of the North Atlantic. Following this, the Commission received and accepted an invitation from the Food and Agriculture Organization (FAO) to hold the Symposium at its headquarters in Rome. The time for the Symposium has now been fixed for January 27 to February 1, 1964. The planning of the Symposium is already far advanced. More than 60 contributions have been promised, and it is hoped that the contributors will be able to submit their papers well in advance of the Symposium in order that they can be circulated and studied before the Symposium to ensure the most complete consideration and discussion of them during the Symposium.

* * * * *

Estimated World Production of Marine Oils, 1955-1963

Type	1/1963	2/1962	3/1961	3/1960	3/1959	3/1958	3/1957	3/1956	3/1955
	(1,000 Short Tons)								
Whale	330	395	428	418	417	435	440	425	420
Sperm whale	115	126	120	122	130	135	110	120	100
Fish (including liver)	760	720	667	514	476	384	385	457	443
Total	1,205	1,241	1,215	1,054	1,023	954	935	1,002	963
1/Forecast.									
2/Partially estimated.									
3/Revised.									

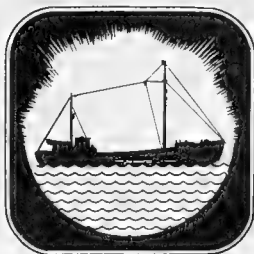
tion in output from whaling areas outside the Antarctic. The reduction in whale-oil output is expected to more than offset the anticipated increase in fish-oil production, principally by Peru, Chile, and perhaps South Africa. (Foreign Crops and Markets, Statistical Supplement, January 31, 1963, U. S. Department of Agriculture.

Note: Data completely revised from that published in Commercial Fisheries Review, January 1963, p. 66. Revision due to new method of compiling data by U. S. Department of Agriculture for years 1955-1963.

NORTHWEST ATLANTIC FISHERIES COMMISSION

ENVIRONMENTAL SYMPOSIUM PLANNED FOR 1964:

This Symposium, the main subject of which is to consider the influence of the environment on the groundfish stocks in the North Atlantic, was originally scheduled to take place in connection with Commission's 13th Annual Meeting in May-June, 1963, in Halifax, Canada. Later it was decided to postpone the Symposium until January 1964, and further to hold it in a place as easily accessible as possible for



THIRTEENTH ANNUAL MEETING SCHEDULED:

The Commission's 13th Annual Meeting is scheduled to take place in Halifax, Canada, May 22-June 8, 1963.

In advance of the meeting the scientific advisers to Panel 5 will meet at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me., to review research on herring and environmental studies and to develop programs of research. This meeting will take place May 8-22.

The meetings to take place in Halifax are scheduled as follows: (1) meeting of the Assessment Group, May 22-25; (2) meetings of the Standing Committee on Research and Statistics and of Groups of Advisers to Panels, May 27-June 1; and (3) Annual Meeting proper, June 3-8.

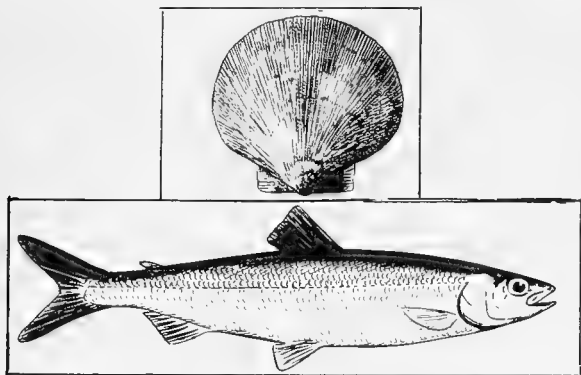
The meetings (1) and (2) will be held in rooms placed at disposal by the Dalhousie University; the Annual Meeting proper will be convened in the Nova Scotian Hotel in Halifax.

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International (Contd.):

MID-1962 MEETING OF
COMMISSION SCIENTISTS:

This meeting was held at the Biological Station, St. Andrews, N.B., Canada. In the meeting participated a number of scientists working with Commission problems from the Biological Stations in St. Andrews, N.B., Boothbay Harbor, Me., and Woods Hole, Mass., and a representative from the Com-



Scallop and herring studies discussed.

mission Secretariat. The main subjects for the meeting were environmental conditions, herring, scallop, and groundfish. Results of work carried out during the preceding year were compared and considered, and plans for future work were elaborated.

* * * * *

AGING TECHNIQUES WORKSHOP HELD:

At this meeting, held in Bergen, Norway, in November 1962, a number of experts directly concerned with the reading of otoliths for age-determination participated in the Workshop. The workshop dealt with the techniques of preparing otoliths for reading and in the main with certain difficulties encountered when reading the otoliths. A number of recommendations were passed aimed at achieving a complete comparability of otolith-readings, at furthering the exchange of otoliths between countries, and at securing the proper procedure for sampling for age-determinations.

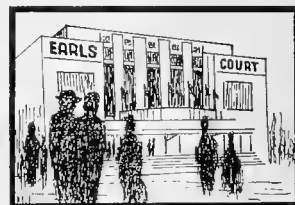
The Subcommittee on Aging Techniques, at the 1961 Annual Meeting, regarded it as very valuable if the Secretariat would approach the International Pacific Halibut Commission requesting its cooperation in the Commission's halibut otolith exchange program. The Halibut Commission has cooperated in the reading of samples of halibut

otoliths submitted by Canada, Denmark, and Iceland and has now submitted two samples of Pacific halibut which are to be circulated to the three member countries participating in the exchange program.

TRADE FAIRS

WORLD FISHING EXHIBITION TO BE HELD
IN LONDON, ENGLAND, MAY 27-31, 1963:

An international display of the latest developments in commercial fishing equipment will be shown at the World Fishing Exhibition to be held at Earls Court, London, England, May 27-31, 1963. Marine engines and auxiliary equipment, nets, fishing gear, marine electronics, and fishing vessel designs will be shown by exhibitors from at least 14 major manufacturing countries. A large display area will be devoted to fully rigged models of the latest midwater, off-the-bottom, and variable-depth trawls. The entire Exhibition will occupy 100,000 square feet of Earls Court.



The Exhibition is sponsored by leading fishermen's organizations in the United Kingdom, as well as by the London Chamber of Commerce, the World Fishing Magazine, the British White Fish Authority, and the Herring Industry Board.

The Exhibition will be open only to those engaged in the fishing industry, and those manufacturers, scientists, and technicians serving their needs. For ticket applications, contact the Exhibition Manager, Commercial Exhibitions, Ltd., St. Richards House, Eversholt St., London, NW1, England.



Australia

FISH AND SHELLFISH LANDINGS
AND VALUE, 1960/61 AND 1961/62:

During the Australian fiscal year ending June 30, 1962, landings of fish and shellfish rose 7.1 percent in volume and 9.6 percent in value as compared with the preceding fiscal year. Landings of finfish in fiscal 1961/62 of 78.7 million pounds were the highest since 1948/49. This plus a record shrimp catch of 9.3 million pounds was largely responsible for the 11.1 percent increase in over-all land-

Australia (Contd.):

ings in 1961/62 over the preceding fiscal year. The 1961/62 landings of spiny lobsters (whole) of 28.8 million pounds valued at US\$12.7 million were up 4.8 percent in weight and 16.1 percent in value from a year earlier. The increase in the value of the spiny lobster landings in this past fiscal year was due primarily to higher prices paid for the frozen lobster tails exported to the United States.

FUNDS ALLOCATED FOR SURVEY OF SPERM WHALE RESOURCE:

The Australian Commonwealth Government has allocated £12,000 (US\$26,880) for each of the years 1963 and 1964 from the Fisheries Development Trust Account for a survey of the sperm whale resource off the Western Australian coast. The survey, to be conducted by the Commonwealth Scientific and Industrial Research Organization, will involve aerial spotting of sperm whales between

Table 1 - Australia's Fisheries Landings^{1/} and Values, 1960/61 and 1961/62^{2/}

Species	3/ 1961/62			3/ 1960/61		
	1,000 Lbs.	£1,000	US\$1,000	1,000 Lbs.	£1,000	US\$1,000
Finfish	78,668	5,955	13,387	70,826	5,907	13,279
Spiny lobster	28,813	5,660	12,724	27,494	4,877	10,963
Shrimp	9,322	1,341	3,015	6,529	961	2,160
Crabs	875	79	178	787	68	153
Oysters	12,613	1,014	2,279	14,220	918	2,064
Scallops	5,172	155	348	6,896	237	533
Other shellfish	1,025	45	101	692	31	70
Total	136,488	3/14,249	3/32,032	127,444	3/12,999	3/29,222

1/Landed weight.

2/Preliminary data.

3/Exclusive of Queensland's fresh-water fish catch.

Note: Australian pounds converted to US\$ at rate of £1 equals US\$2.240.

Table 2 - Landings by Australian States,^{1/} 1960/61 and 1961/62

Species	Queensland		New South Wales		Victoria		South Australia		Western Australia		Tasmania	
	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61
Finfish	8,834	6,892	27,071	28,260	11,995	11,444	15,059	12,735	9,300	7,596	6,182	3,503
Spiny lobster	54	41	398	476	1,134	1,266	4,025	3,721	19,238	18,019	3,964	3,971
Shrimp	4,400	3,500	4,678	2,916	4	7	-	-	239	106	-	-
Crabs	625	595	190	144	-	-	-	-	59	48	-	-
Oysters	323	242	12,204	13,296	65	162	-	-	10	515	1	5
Scallops	400	1,600	-	-	-	-	-	-	-	-	4,772	5,296
Other shellfish	117	67	-	-	894	557	-	-	14	68	-	-
Total	14,753	12,937	44,541	45,092	14,092	13,436	19,084	16,456	28,860	26,352	14,919	12,775

1/Exclusive of about 239,000 pounds in 1961/62 and 396,000 pounds in 1960/61 landed in Australia's Northern Territory.

2/Exclusive of fresh-water fish caught in Queensland.

Australian 1961/62 landings as compared to the preceding fiscal year by States were marked by sharp increases in landings of shrimp in New South Wales (up 60.0 percent) and in Queensland (up 31.0 percent). The higher landings of finfish this past fiscal year over 1960/61 were due partly to record tuna landings in South Australia, increased mullet landings in Queensland, and an excellent salmon-trout season in Western Australia. The 25.0 percent decrease in landings of scallops during 1961/62 was due mainly to a sharp drop (75.0 percent) in the landings in Queensland. The Queensland scallop fishermen in 1961/62 diverted some of their fishing effort to the more lucrative shrimp fishery.

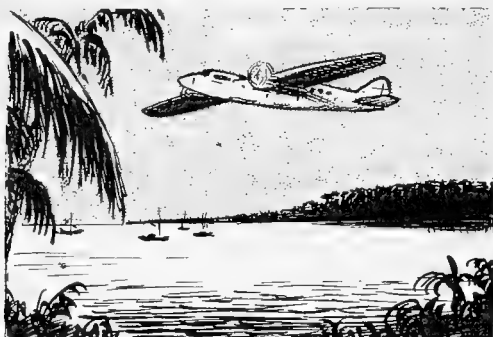
Albany and Shark Bay, and will be augmented by spotting carried out by two private whaling companies. (United States Embassy, Canberra, January 11, 1963.)

TUNA SURVEY OFF WESTERN AUSTRALIA:

A total of £40,000 (US\$89,600) has been spent for a survey of the commercial potential of tuna off southwest Western Australia. Australia's leading tuna fisherman commanded the chartered tuna clipper Estelle Star to carry out the work. Despite abnormally bad weather conditions, the survey, which started on July 31, 1961, achieved good coverage of the area.

Australia (Contd.):

During the closing stages of the survey, approval was given for the expenditure of up to £2,500 (\$5,600) for the charter of a suitable airplane to help in the exploratory operations. A twin-engined aircraft was



chartered from a Perth firm and 22 flights were carried out during May, June, and early July 1961.

The Estelle Star trolled for tuna continuously while at sea, and used the pole-and-live-bait method of fishing when suitable schools of tuna were found. An experimental long line provided by CSIRO was shot on six occasions.

The immediate conclusion of the survey is that tuna fishing on a commercial scale could not have been maintained during the 12 months the Estelle Star worked in the area. This conclusion is not equivalent to saying that a tuna fishery cannot be established, since the year may have been abnormal in some fundamental respects. Weather, for instance, was reported as "abnormally bad," but the basic reason for low catches seems to have been a scarcity of fish of the size required by the canner.

During the whole of the period of the survey, a CSIRO officer was on board Estelle Star and a great deal of valuable scientific information was obtained. More than 5,000 small tuna were measured and tagged, and over 1,000 observations made of the environmental conditions, including temperature and salinity. The tagging program particularly is of great value for the study of the distribution and migration of tuna around Australia. (Australian Fisheries Newsletter, November 1962.)



Brazil

ERADICATION OF PIRANHA
IN INLAND WATERS:

A small news item, "Piranhas a Problem in Brazil's Inland Waters" (Commercial Fisheries Review, January 1962 p. 9), has prompted a Brazilian Government biologist to write the following article in clarification of the piranha problem in Brazil

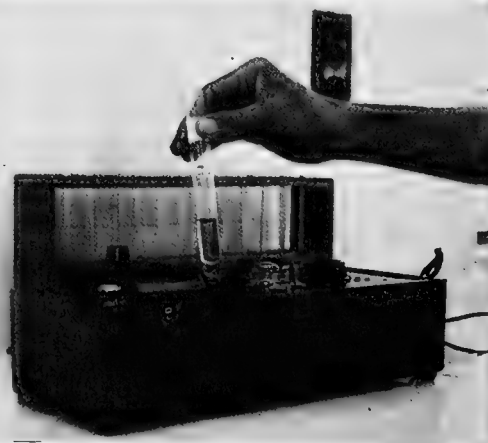


Fig. 1 - Determining the content of rotenone in a sample of timbo powder by the colorimetric-photoelectric process.

The results of the Brazilian Government's fight against the piranha (Serrasalmus) are tangible and compensating, and the cost relatively low.



Fig. 2 - A specimen of piranha (Serrasalmus) measuring 14 inches in length, from the Jaguaribe River.

At the request of the Service de Pisciculture (Pisciculture Service) of the National Department of Works Against the Droughts

Brazil (Contd.):

("Departamento Nacional de Obras Contra as Secas"), from 1957 to 1961, with the cooperation of the biologists of our agency, we intensified the fight against the piranha and succeeded in exterminating that harmful species in 10 dams, with a total hydrographic basin area of 18,532.8 square miles in the northeastern region of Brazil known as the "Drought Polygon."



Fig. 3 - A close-up of a piranha's head, showing the teeth.

In the state of Ceara alone, its two largest hydrographic basins are infested with piranhas: Jaguaribe River (28,957.5 square miles) and Acarau River (15,354.7 square miles). In those areas, great losses are inflicted upon cattle and men, particularly those who fish for a living. Small scars, but also mutilations and even loss of lives are traceable to the awesome piranha.

The above rivers flow only in the rainy season, but the small lagoons remaining in their beds for the dry season present a serious danger for the livestock, as they are teeming with piranhas.

The dams constructed in those hydrographic basins become real piranha ponds, precluding people from taking advantage of them as a fishing source. Extensive damage is caused to fishing gear by the fish, and fishing is avoided because of its dangers.

The biologists of the Pisciculture Service carried out tests with "timbo" powder



Fig. 4 - The wound inflicted on a 16-year-old boy attacked by a piranha in the "Riacho dos Cavalos" Dam, Paraiba State. The photo was taken five minutes after the accident.



Fig. 5 - Fisherman in the "Riacho do Sangue" Dam, Ceara State, shows a mutilated little finger caused by a piranha attack.

Brazil (Contd.):

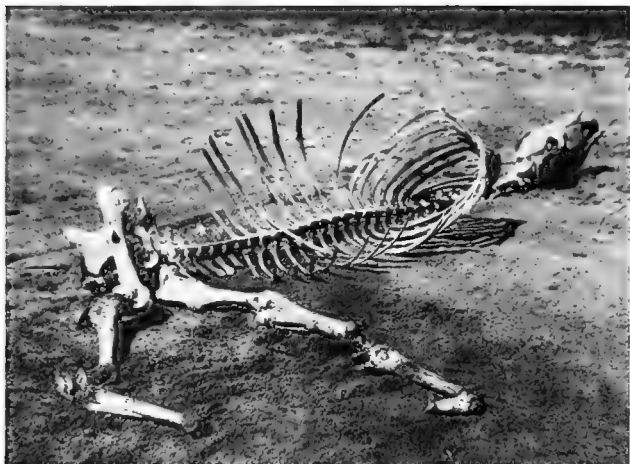


Fig. 6 - Remains of the skeleton of a horse eaten up by piranhas in "Santo Antonio de Russas" Dam, Ceara State.

and found that piranha is the regional species most sensitive to the action of the rotenone it contains (6 percent).



Fig. 7 - Workers handling timbo powder are protected by face masks.

The powder is obtained in the Amazon by grinding the roots of certain plants of the Sapindaceae, Leguminosae, Euphorbiaceae family, popularly known as "timbo."

The tests with the powder were made by applying it to the water at the rate of 3 parts per million (p.p.m.). It eliminated the piranha (egg, larvae, young, and adult) within 11 to 15 minutes, with little damage to the young, fingerlings, and adults of all the other regional species.

Work plans were made and carried out in the dry seasons. While the engineers were building the dams, the biologists were search-

ing the upstream hydrographic basin, "poisoning" ("tin guiando") all the bodies of water, making a real selective eradication of the piranha.



Fig. 8 - Workers in canoes spraying timbo powder in deep waters.

"Oros" Dam is the largest basin where this work has been done. Its area totals 9,652.5 square miles. The "Oros" Dam was built on the Jaguaribe River, in the State of Ceara, and can impound 141,262,400,000 cubic feet of water, absolutely free from piranhas.

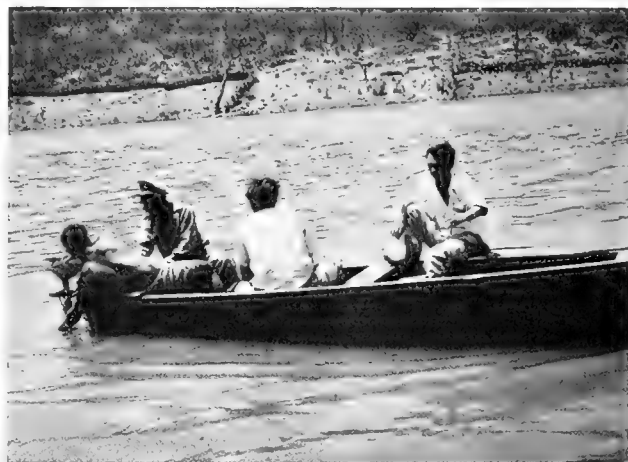


Fig. 9 - In deeper places, timbo paste is being applied with the aid of a funnel to which a rubber tube is attached.

Upstream from the "Oros" Dam, in the Jaguaribe River, an already existing dam called "Varzea do Boi" (1,833,232,796 cubic feet) was "poisoned." For economy sake, and also for increased efficiency, its volume was reduced to 42,378,720 cubic feet before the operation began. In that reservoir 3.5 metric tons of "timbo" powder were used, and 150 men and 40 boats employed to apply the ichthyotoxic substance.

Brazil (Contd.):

Thousands of piranhas died in the three days the work was carried out. After 72 hours, 60 dynamite charges were blasted off in many places of the dam. Specimens of seven different species were collected be-



Fig. 10 - Specimen of a piranha killed by timbo powder.

longing to the Cichlidae, Loricariidae, Characidae, Pimelodidae, and Poeciliidae families, which shows the selective character of the process used to eradicate piranhas. A larger volume of water than the above, the largest ever successfully "poisoned," was the "Po-co da Cruz" Dam, in the State of Pernambuco, in the Moxoto River basin of the Sao Francisco River, soon after its completion, when 60,044,000 cubic feet of water were impounded. Four metric tons of "timbo" powder were applied there in October 1957. The dam now holds 17,660,000,000 cubic feet, and not a single specimen of piranha has been reported so far, despite intensive fishing, which is proof of the efficacy of the poison.

To avoid the piranha plague in the "Araras" Dam (35,315,600,000 cubic ft.) in the Acarau River, a complete eradication program was carried out in its basin, an area of 1,351.3 square miles. While the engineers were building the dam, our biologists were working upstream.

The work was done in 113 days (October 27, 1957, to February 2, 1958). The expedition traveled 621.4 miles along the bed of 3 rivers and 67 creeks. "Poisoning" was done on 758 "pocos" (depressions in the bed of the river where water remains most of the dry season), 46 drinking places, 3 dams, and 1



Fig. 11 - Piranha (Serrasalmus) killed by timbo powder.

lagoon; test blasts with dynamite were made on 34 "pocos," 129 dams, 13 drinking places, and 6 lagoons; piranhas were found and eradicated in 48 "pocos" and 1 lagoon. A total of 4.5 metric tons of "timbo" powder was used.

The total cost of the work was Cr.\$1,531,255 (US\$9,754), including personnel and supplies for the complete eradication of the "Araras" Dam and its whole hydrographic basin.

In fishing licenses alone, from January 1961 to May 1962, in the "Araras" Dam, the Federal Government collected from fishermen Cr.\$4,625,548 (\$29,465). Accurate statistics for the same period show a production of 3,323 metric tons of fish, worth Cr.\$80,855,051 (\$515,047). Such work can never be deemed as costly, especially considering that the "Estevam Marinho" Dam, formerly "Curema" (48,029,216,000 cubic ft., therefore larger than the "Araras") collected in the same pe-

Brazil (Contd.):

riod only Cr.\$2,018,788 (\$12,860) in fishing licenses and yielded only 1,366 tons of fish worth Cr.\$45,273,525 (\$288,392) because fishing was severely curtailed by the presence of piranha.

Even if the economic results obtained from fishing were not so high, the sole advantage of freeing the livestock and the people of the region from the carnivorous piranha would justify the cost of the work.



Fig. 12 - "Escama Peixe" (Fish Barrier) built in a drainage ditch to prevent entry of piranhas.

As the piranha does not leap or jump, and to prevent downstream specimens from returning to already "cleaned" dams, a special barrier, regionally called "Escama Peixe," is built in the spillway. Ceara is the North-

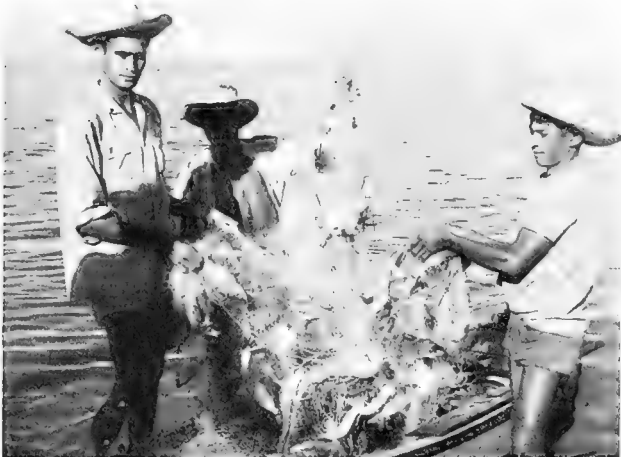


Fig. 13 - Two fishermen with a 200 x 3 meter nylon net caught 102 kilograms (224 pounds) of fish during a night's fishing in "Araras" Dam, Ceara State, thanks to the extermination of piranhas, formerly performed in that dam.

eastern state which benefited most from the piranha eradication work, as that species has been exterminated in the basins of the Jaguari-be and Acarau Rivers, an area of 16,861,913.6 square miles, which amounts to 29.6 percent of the total State area.

In view of the remarkable results achieved, the Pisciculture Service intends to resume the piranha eradication work in the inland waters of the "Drought Polygon" of Northeastern Brazil.

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--Osmar Fontenele, Biologist,
Pisciculture Service, National
Department of Works Against Droughts,
Brazil.

Note: Values converted at rate of 156.87 cruzeiros equal US\$1.



Canada

ARCTIC CHAR FROM FAR NORTH WIDELY DISTRIBUTED:

Providing a way can be found to spread small fishing operations over a large area of northern Canada, there seems to be a promising future for the Arctic char. This widely distributed species from the Far North is rapidly becoming a favorite item on hotel and restaurant menus in both Canada and the United States. It is also gaining popularity as a sport fish for anglers who like to travel far and explore new territory. In addition, the Eskimos have found it a new source of livelihood.

Scientists of the Fisheries Research Board of Canada have found Arctic char practically everywhere in the Arctic Archipelago. Last summer they made an extensive survey, mainly on fish and biological oceanography, and on marine mammals where possible, in the Canadian Arctic islands. A report submitted at the Board's annual meeting in Ottawa in January this year told of the extent of the survey.

A coordinating base was established at Cambridge Bay on Victoria Island, Northwest Territories, and four stationary camps were established at Eureka on Ellesmere Island, Assistance Bay on Cornwallis Island, Cresswell Bay on Somerset Island; and at the mouth of the Thomsen River on Banks Island. All those islands are in the Arctic Ocean.

From those camps visits were made to Axel Heiberg Island, Grinnell Peninsula on Devon Island, Prince of Wales Strait, and lakes on several of the larger islands.

In addition to both landlocked and anadromous Arctic char, the scientists found lake herring, lake trout, and whitefish farther north than had been considered the normal range of these species. (Canadian Department of Fisheries, January 7, 1963.)

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BASIC RESEARCH ON FISH FLAVORS MAY LEAD TO NEW PRODUCTS:

Baked halibut that tasted and smelled like baked king spring salmon was prepared at Canada's Vancouver Fishery Technological Station during 1962. This was reported at the annual meeting of the Fisheries Research Board of Canada in Ottawa on January 5, 1963.

The new product with the switch in flavor was not prepared to fool the taste buds or to make halibut palatable for that choice fish has few taste superiors. Rather it was a blend of halibut, king salmon oils, and water prepared by the Board's scientists who are seeking to understand the phenomena of fish flavor. During this year, the studies are being concentrated upon the flavors of baked king salmon and Pacific oyster.

This basic research program may be expected to broaden considerably in the future. As new techniques are developed and perfected, scientists will be able to make appraisals of fish flavors that are impossible at the moment. (Department of Fisheries, Ottawa, Jan. 5, 1963.)

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BRITISH COLUMBIA SHUCKED OYSTER PRODUCTION, 1962:

Preliminary data on British Columbia's production of shucked oysters in 1962 shows an increase of about 11 percent as compared with 1961 and up 28 percent from the 78,395 Imperial gallons produced in 1960.

British Columbia Oyster Meats Production, 1961-62		
Liquid Measure	1/1962	2/1961
Half-pints	411,235	353,931
Pints	20,503	23,363
Quarts	75,462	38,379
Gallons	50,061	45,602
Total in Imperial Gallons	100,343	90,372
1/Preliminary. 2/Revised.		

Prices to producers for shucked oysters in December 1962 were as follows for Imperial measures: half-pints, C\$0.30-0.40; pints, \$0.60-0.75; quarts, \$1.00-1.65, and gallons, \$3.25-5.25. In December 1961 the price for Imperial gallons was \$3.15-5.25, and in December 1960 it was \$3.00-5.25.

The retail price of shucked oysters in Vancouver on January 15, 1963, for an Imperial half-pint was 50-55 Canadian cents or unchanged from the retail level on the same date of 1962.

Note: See Commercial Fisheries Review, March 1962 p. 35.

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CONTRACT LET FOR NEW NEWFOUNDLAND BAIT SERVICE VESSEL:

Contract for the construction of a new 165-foot freezer-bait vessel for Newfoundland was

Canada (Contd.):

announced on January 15, 1963, by Canada's Fisheries Minister. The vessel, which will cost C\$1,415,380, will be built by a Province of Quebec shipbuilding firm.

The new vessel will play a prominent part in the Department's Newfoundland bait service program. It will be capable of freezing bait fish (such as squid, herring, and caplin) at point of capture and will be used to transfer frozen bait stocks from areas of surplus to areas of shortage. The vessel will transport bait to bait depots and holding units located in some 50 fishing settlements around the coast of Newfoundland. When completed it will replace the M/V Arctica, which has provided yeoman service for the Province's fishermen for over 25 years.

Of welded-steel construction and aluminum superstructure, the new vessel will be strengthened for navigation in ice. It will have a holding capacity of 190 tons and its freezers will be capable of freezing about 15,000 pounds of bait in 18 hours. Modern principles of shipboard freezing will be employed and the bait will be frozen in blocks of uniform weight for storage in cardboard cartons.

A single-screw, Diesel-engined craft, the vessel is designed in accordance with the latest requirements of the Canadian Steamship Inspection Service. It is expected to have a cruising speed of 12 knots, and in addition to its bait supply services, it will assist other Departmental vessels in the Newfoundland area in patrol duties. When necessary it will also take part in search and rescue operations.

The replacement of the M/V Arctica, probably late in 1963 or early 1964, with this modern refrigerated vessel represents a further step in Canada's program of extending and modernizing the bait service. Over the past several years 28 bait-holding units have been added to the original 20 depots taken over at the time of Union and in addition three refrigerated trucks have been put into service to transfer bait between cold storages in those areas where road facilities exist.

Note: See Commercial Fisheries Review, November 1962 p. 59.

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FISH PROTEIN CONCENTRATE EXPERIMENTS ENCOURAGING:

The production of fish protein concentrate or fish flour from less expensive and easily available fish is being studied by technologists of the Fisheries Research Board of Canada. A report on this project was given at the Board's annual meeting in Ottawa early in January this year by scientists of the Board's research station in Halifax.

Recently a scientific team at that station produced a superior quality fish flour from cod fillets. This was done because of the interest of the Food and Agriculture Organization (FAO) in a product that would pass its rigid specifications. Preliminary reports on nutrition tests now being carried out by the Department of National Health and Welfare, the National Research Council, and the U. S. Bureau of Commercial Fisheries show it to be of excellent quality.

With the completion of this project, the Board's technologists are now producing a fish protein concentrate from cheaper fish. At present, work is continuing on the use of cod trimmings (not the head and viscera), non-oily fish, and oily species such as herring. Initial results show that non-oily starting material can be used to yield a fish flour of only slightly different appearance from the concentrate produced from cod fillets, but retaining the same nutritive qualities.

The development of fish flour is not new. It started as a postwar effort by FAO and was undertaken by many of the world's leading fisheries research laboratories, including the Halifax Station. The program was prompted by a desire to supply underdeveloped nations with a cheap supply of animal protein.

In addition, dietetic studies in Canada and the United States showed a need for additional proteins in some diet formulations, especially for people engaged in heavy manual work, postoperative patients, and elderly people. One of the simplest uses of the product would be as an additive to bread, cereals, and other foodstuffs where protein supplementation could be advantageous. Experimental work in this field is being carried out by the Consumer Branch of the Department of Fisheries of Canada.

Canada (Contd.):

For all practical purposes properly prepared fish flour is tasteless and odorless. It is about 90 percent protein and of high nutritive value.

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FISH SAUSAGE MADE FROM WHITEFISH:

As part of Canada's policy of creating greater potential markets for fishery products, technologists of the Fisheries Research Board of Canada have developed a fish sausage made from fresh-water whitefish. The new product is similar in texture



to that of the more familiar pork product. A report on the project was given on January 5, 1963, at the Board's annual meeting in Ottawa.

The formula for the fish sausage resembles that of the pork product. Fish fillets are minced to a pulp in a grinder and are blended with precise amounts of fat, spices, and water. At first, cereal was used as a binder, but later this was discontinued as it was found that its absence did not affect the texture, consistency, and flavor of the product. Tests showed that the texture of the product was affected by the sequence of ingredients added in the mixing operation, by the temperature during the mixing process, and by the time consumed in the mixing operation.

Important assistance was given to the scientists by the appearance on the market of a new type of homogenizer or mixer. In the early stages of the project, the presence of bones in the ground-up fish had created problems. With the new homogenizer the small bones are reduced to a thin paste. (Department of Fisheries, Ottawa, January 5, 1963.)

Note: See Commercial Fisheries Review, September 1962 p. 66.

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FISHERY RESEARCH AIDED BY UNDERWATER OBSERVATIONS IN 1962:

The past year has seen an increased interest in underwater exploration by the staff at the St. Andrews, New Brunswick, Biological Station of the Fisheries Research Board of Canada. Not content with remaining at the surface without seeing directly what went on below, scientists and technicians alike have been actively seeking information on the bottom of the sea. The fields of this research have been quite varied; for example, one member of the St. Andrews team spent several weeks in the Arctic, assisting in the study of the distribution of marine arctic species.

In the Bay of Chaleur, divers mapped the areas where herring had spawned, and from their counts of the eggs, deduced how many herring there were in that part of the ocean and what percentage had been caught by local fishermen. They estimated that about 185 million fish, weighing 54.7 million pounds, had contributed to the spawning and of those 2.2 million pounds or four percent had actually been caught.

Lobsters have been studied, more to learn about the animal itself rather than about the fishery. Divers have seen how small lobsters are caught, or perhaps not caught, by special drags used to estimate the lobster population. They have also seen how lobsters hide under rocks and stones during the daytime, and how quickly they will move into drainage tile "houses" provided for them on the sea bed.

Of specific interest to the scallop fishery was the assessment of the efficiency of scallop drags by the divers. Members of the team took turns in riding on the drag as it was towed over the sea bed and counted the scallops that swam out from its path. They also followed the path of the drag picking up scallops the drag had missed. Finally they cleared a large measured area of scallops and brought them ashore for measuring so that the scallop population of the area could be assessed. From these sorts of observations it is hoped that in time more efficient ways of fishing scallops may be devised.

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SCIENTISTS REPORT ON FUR SEAL INVESTIGATIONS:

Scientists of Canada's Fisheries Research Board have completed five years of investigations of fur seals in cooperation with Japan,

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the United States, and the Soviet Union, under the terms of the Interim Convention on Conservation of North Pacific Fur Seals.

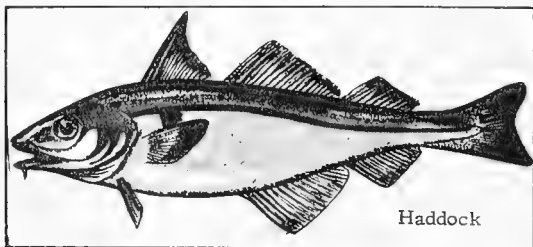


The fur seals were collected for study in Hecate Strait and the northern mainland inlets of British Columbia, the west coast of Vancouver Island, and in the Gulf of Alaska during 1962. A research vessel took 501 from total sightings of approximately 2,000. Nineteen tagged seals of Pribilof origin were recovered, according to a January 4, 1963, report on fur seals given at the Board's annual meeting in Ottawa.

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GROUNDFISH RESEARCH REVIEWED AT 1962 ANNUAL MEETING OF SCIENTISTS:

Haddock: The haddock fishery on the Newfoundland Grand Bank, which has been highly productive in recent years, is tapering off rapidly as stocks have become de-



Haddock

pleted, biologists of Canada's Fisheries Re-Board reported on January 5, 1963. No new year-classes of commercial importance have appeared since 1955 and 1956 and the fishery for that species has been intensified by the entry of the Russian fleet in 1960.

The haddock investigations also took in the St. Pierre Bank. Here the Board's research vessel A. T. Cameron found the species in

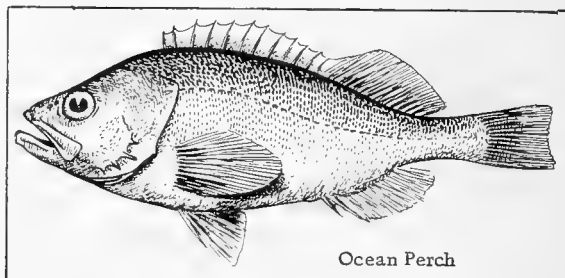


Research vessel A. T. Cameron.

short supply. At two stations small quantities of baby haddock were caught but it is too soon to say whether or not the small haddock are sufficiently abundant to sustain a fishery in the future. Past surveys have indicated, however, that patchy concentrations have never really produced very successful year-classes.

There has been no significant commercial fishery for haddock on the St. Pierre Bank since 1956.

Ocean Perch: In the past four years practically all the possible ocean perch trawling grounds in the Northwest Atlantic from Southern Nova Scotia to the Arctic have been surveyed by the staff of the St. John's, Newfoundland, Biological Station. This comprehensive survey, which covered the entire depth range of the ocean perch, extending down to 400 fathoms, was carried out by the A. T. Cameron.



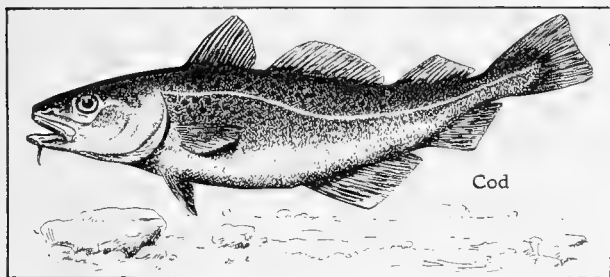
Ocean Perch

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The purpose of the investigations has been to assess the magnitude of present stocks of ocean perch and the extent of the potential fishing grounds. Background biological information has also been collected on such things as growth, movements, feeding, and reproduction. This is used in the formulation of plans for obtaining maximum sustained yield from this valuable marine resource by rational exploitation.

Sea Dab: Another report was about American plaice or sea dabs which, it was found, grow faster on the southern half of the Newfoundland Grand Bank than on the northern half of the great underwater shelf.

Cod: Tagging was carried out in 1962 for the first time since 1954-55, when 19,000 cod were tagged in Newfoundland inshore and bank areas. The purpose of the present pro-



gram, in which 10,000 fish have been tagged, is to show what changes have occurred in the cod stocks and what intermingling takes place of the populations both inshore and offshore.

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LAMPREY POPULATION CONTROL IN LAKE SUPERIOR:

There is now concrete evidence of the possibility that the lamprey population of Lake Superior can be controlled. This encouraging information was contained in a report released on January 4, 1963, at the annual meeting in Ottawa of the Fisheries Research Board of Canada. The report also pointed out that the predator, which has played havoc with the valuable fish stocks of the Great Lakes, can only be checked fully through a stepped-up control program.

The report, presented by the Board's London, Ont., Biological Station, noted that the lamprey population in Lake Superior has been reduced greatly. This was indicated by



Electric barriers control sea lamprey spawning.

lamprey counts taken in 1962 at electrical barriers placed on streams tributary to the Lake. The barriers prevent the adult lamprey from ascending the streams to spawn.

The Board is responsible for much of Canada's share of the scientific investigations of the lamprey problem, under an agreement with the Great Lakes Fishery Commission (Canada and United States).

The smaller numbers of lamprey found in the Lake in 1962 are due undoubtedly to the scientifically developed control measures employed, the report stated. At the present time a lampricide, a specific toxicant, is used against the predators while they are in the larval stage, during which most of them live in burrows in the beds of streams where they are hatched.

The electrical barriers also may have contributed to the reduced populations. Although a small number of lamprey have managed to slip by the barriers and reached upstream spawning grounds, nevertheless there can be little doubt that they have prevented the major part of recent runs from spawning.

Despite the progress that scientists have made in unravelling the lamprey problem, there is still a great need for biological knowledge concerning its characteristics and life-history. Consideration must be given also to the matter of lamprey larvae populations in Lake Superior itself. The larvae, always thought of in the past as stream dwellers only, were found in fairly substantial numbers in the open Lake between 1960 and 1962.

Canada (Contd.):

Although it is impossible to estimate their numbers, the report suggests that they constitute enough of a menace to fish stocks to warrant being included in lamprey control plans.

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NEW BARGE TO SERVE AS FLOATING LABORATORY FOR BIOLOGISTS:

A novel type of scientific vehicle will make its appearance along British Columbia's coast-line in 1963. It will be a 76-foot steel research barge on which scientists of the Fisheries Research Board of Canada will conduct studies on fish populations. The barge is being built in British Columbia at a cost of C\$98,004 and should be ready for operation by April 1963.

The barge will be used as a floating laboratory and will be towed to various points along the coast where studies are to be made. It will be capable of accommodating an operating crew of 14 men for extended periods of time. Tentative plans call for the barge to be used along the British Columbia coast during the summer of 1963 to observe young salmon as they emerge from fresh water into the Pacific Ocean.

The hull and deckside of the barge will be constructed entirely of steel, while some other areas will be of wood construction. The barge will be assigned to the Board's Biological Station at Nanaimo, B. C.

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NEW DIRECTIONS IN FISHERIES RESEARCH DISCUSSED AT ANNUAL MEETING:

New directions in fisheries research, taken in the national interest, were noted by the Canadian Fisheries Minister at the opening (January 3, 1963) in Ottawa of the annual meeting of the Fisheries Research Board of Canada. He referred specifically to the Board's future role in the study of oceanography as well as its biological and technological programs under which results could be coordinated and applied to practical fishery management.

The Minister approved the fact that special consideration was given at the meeting to the study of oceanography and to the in-

creasingly complex subject of experimental biology. He thought Canada was fortunate in having well-organized programs in the former field developed through the Canadian Committee on Oceanography, where the needs and capabilities of all Canadian government agencies and oceanographic institutes could be considered and evaluated. He was pleased to note that representatives of the Department of Mines and Technical Surveys would be present at deliberations on oceanography.

In the field of experimental biology, he stated, more exact knowledge of the animals we are interested in became more and more important as man continued to change many aspects of the natural environment. This was particularly true, he said, of the fresh-water environment of salmon on both our coasts. He was gratified to know that the board had this important problem under constant and careful review and that answers were being developed as fast as our resources would allow. The Minister made particular reference to the need for maintaining and if possible increasing the numbers of Atlantic salmon, a fish in which there is great interest among many people not only as a commercial species, but as a sport fish. It has been declining in numbers since the white man first appeared on this continent and he thought it was of vital importance that its survival should be assured.

The progressive increase in fishing intensity on international fishing grounds by fishing fleets primarily from Europe and Asia was also mentioned by the Minister. Some of those grounds, off Canadian shores, have been fished by Canadian fishermen for so long that we have almost begun to think of them as our own, he said. The Minister was happy to see that the combined resources of the Department of Fisheries and the Fisheries Research Board were being brought to bear on improving the efficiency of fishing operations and the elimination of waste.

The international aspect of the fisheries was also referred to in the annual report of the Chairman of the Board, who said that the inevitable changes in the national and international fishing scene would be reflected in research requirements. It was certain, he said, that international studies would be continued if the conservation of high-seas resources was to be effective. In reporting on the manifold duties of the Board, the chairman said that more than half the resources of money, men, and materials spent on biological in-

Canada (Contd.):

vestigations was devoted to researches dictated by the needs of the five international fishery and sea-mammal commissions to which Canada is party.

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OCEANOGRAPHIC INFORMATION SERVICE AIDED BY AIRBORNE RADIATION THERMOMETER:

The airborne radiation thermometer developed by the Pacific Oceanographic Group (Nanaimo, B. C.) of the Fisheries Research Board of Canada has proved very successful, the annual meeting of the Board was told in Ottawa on January 3, 1963.

The airborne radiation thermometer is a device which enables readings of water surface temperatures from high speed aircraft. Following the successful trials of the device, four new units are being built for use on the Pacific and Atlantic coasts. The new units incorporate improvements to the first model.

The oceanographic information service developed by the group in collaboration with other scientific bodies, has completed its first full year of operation on Canada's Pacific coast. Group officials say the information service functioned successfully. In concept and operation the service is similar to the Meteorological Service, providing regular assessments of oceanographic changes rather than those of the weather.

The oceanographic information service has potential as an important aid to commercial fishing operations, as its scope and coverage are extended. The day is already in sight, a senior Canadian oceanographer states, when fishermen will find this information as vital to them as are the weather forecasts now. The movements of fish are very closely related to temperature and other conditions in the sea, and prior knowledge of changes in such conditions will be of great use in locating fish at a given period and place.

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REFRIGERATED SEA WATER USED BY FISHING VESSELS:

The increasing use of refrigerated sea water for transporting salmon in British Columbia and the success of the brine-spray freezing system used on two Canadian tuna

vessels were described to the annual meeting of the Fisheries Research Board of Canada in Ottawa on January 4, 1963.

In British Columbia, refrigerated sea water equipment was added to two large barges in 1962. The barges have a combined capacity of over one million pounds of fish. The equipment was also added to four more salmon packers (transport vessels). British Columbia transport vessels using the equipment now have a combined single-trip holding capacity of 2.5 million pounds. In 1962, salmon packers were running long distances between the fishing grounds and canneries. The performance of refrigerated sea water equipment was considered superior in landing fish in prime condition.

Two applications of the refrigerated sea water system are in use in British Columbia. One involves mechanical refrigeration while the other uses a mixture of ice and salt for refrigeration.

Although the Canadian brine-spray freezing system is similar to the freezing method used on United States tuna vessels, it differs in three important respects. In the Canadian-designed system, freon refrigerant is used instead of ammonia; external heat exchangers are substituted for coils in the hold; and the fish hold is insulated and jacketed for dry-frozen storage of fish. The tuna catches landed by the two Canadian vessels equipped with the system were in excellent condition and the system was found to require little maintenance in operation.

Note: See *Commercial Fisheries Review*, November 1962 p. 61, February 1962 p. 59.

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REFRIGERATION STANDARDS FOR CARRIERS OF FISHERY PRODUCTS PROPOSED:

Regulations containing strict refrigeration standards for rail and motor carriers hauling fresh and frozen fishery products have been proposed by the Canadian Department of Fisheries, according to reports. The regulations would affect carriers moving fishery products in Canadian foreign trade as well as inter-provincial trade. The proposed regulations are said to contain the following standards:

(1) Fresh, whole, or processed fish shall be transported in export or import trade by

Canada (Contd.):

carriers maintaining a maximum product temperature of 35° F.

(2) Frozen, whole, or processed fish shall be transported in export or import trade by carriers maintaining a product temperature of 0° F. or lower, provided that a transition period during which procedures may be improved and equipment modified may be permitted according to the following schedule: January 1, 1963 to December 31, 1963, maximum of 20° F.; after January 1, 1964, 0° F. or lower.

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NEW AIR PRESSURE SYSTEM FOR UNLOADING SALMON DEMONSTRATED:

The "pneumatic unloading" system of the Canadian salmon packer Derek Todd puts salmon on the dock with remarkable speed. The system involves the use of air pressure to force fish out of specially constructed tanks. Successful trials of "pneumatic unloading" in British Columbia were described to the annual meeting of the Fisheries Research Board of Canada in Ottawa on January 3, 1963.

The Board's Vancouver technological station worked in collaboration with a Vancouver fishing company in developing the system. The Derek Todd was equipped with four air pressure tanks and has a total capacity of 129,000 pounds of fish. The vessel also has a mechanically operated refrigerated sea water unit.

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PACIFIC SALMON TAGGING AND DISTRIBUTION STUDIES, 1962:

The 1962 tagging and distribution studies of Pacific salmon on the high seas were described as an "outstanding success" in a report submitted on January 4, 1963, to the an-

nual meeting in Ottawa of the Fisheries Research Board of Canada.

Under the direction of the Board's biological Station in Nanaimo, B.C., four chartered vessels used Japanese long-line gear to take salmon over a broad area of the Gulf of Alaska--up to more than a thousand miles from the coast. Nearly 20,000 salmon of all species were caught, tagged, and released and over seven percent of them were recovered.

Primarily, the tagging program was aimed at charting the distribution of Canadian west coast salmon stocks on the high seas. This has been accomplished. The main bodies of Canadian salmon were found to be well east of current Japanese deep-sea salmon fishing operations, confirming conclusions reached earlier by fisheries scientists.

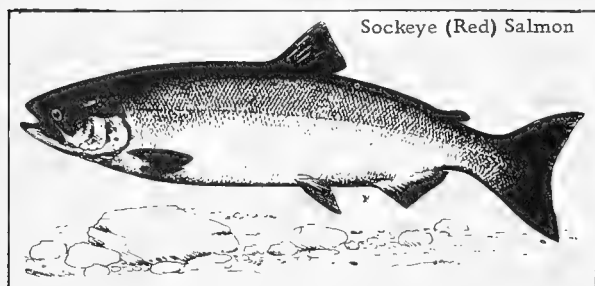
Distribution patterns were found to be surprisingly consistent and apparently linked to oceanographic conditions. This discovery has opened new approaches to the problems of ocean survival and growth, as well as to prediction of the sizes of runs.

During April and May 1962, a preliminary attempt was made to identify the origin of the sockeye salmon, several weeks before the maturing fish would head for their home streams. Scale readings indicated that over two-thirds of the sockeye were headed for Alaskan streams and that the proportion bound for Adams River, B.C., was small. These estimates followed the actual catch percentages very closely. Alaska produced about 70 percent of the total North American sockeye catch in 1962, while the Adams River run was very small. Those results suggest that useful advance information on the relative abundance of runs may be gained through similar programs.

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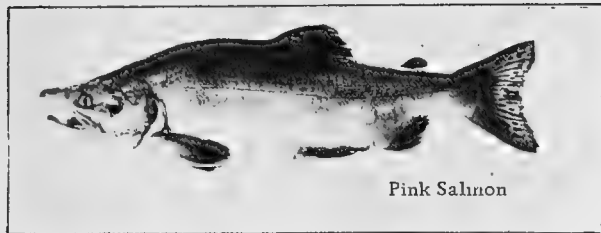
PINK SALMON EGGS FROM BRITISH COLUMBIA TRANSPLANTED IN NEWFOUNDLAND RIVER:

A major undertaking in 1962 by the St. John's, Newfoundland, Biological Station of the Fisheries Research Board of Canada, was the transplant of some 2.5 million pink salmon eggs from British Columbia to Newfoundland. The eyed eggs, spawned in a British Columbia River, were transported by air in late November 1962 to St. John's, and from there were taken by road transport to North Harbour River, St. Mary's Bay.



Sockeye (Red) Salmon

Canada (Contd.):



Within days the transplant was completed, but preparation of the receiving channel had occupied many months. The channel, 1,770 feet long and 16 feet wide, was excavated about 2.5 miles upstream from the mouth of the river, and was filled with washed gravel to a depth of one foot.

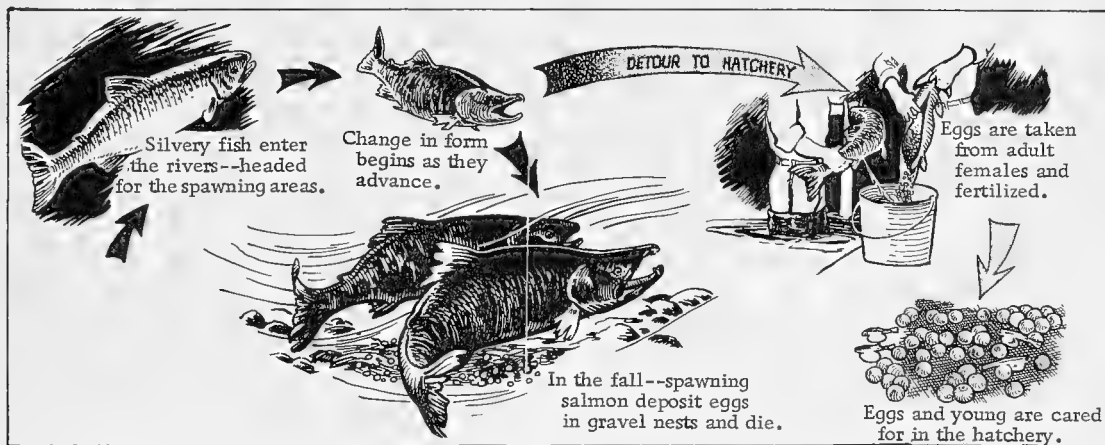
About 50 feet from the head of the channel a dam was constructed, and, to prevent scouring, the area below the dam for a distance of 65 feet was covered with small boulders.

SCIENTISTS EXTEND NORMAL LIFE CYCLE OF SOCKEYE SALMON:

Adult sockeye or red salmon which would have spawned and died under natural conditions have been kept alive in captivity at the Vancouver, B. C., Technological Station of the Fisheries Research Board of Canada. The Board heard a report on this and other activities of the Technological Station during its January 1963 annual meeting in Ottawa.

Some of the fish have survived for over a year in excess of their normal lifespan in an experiment which has stimulated studies of biochemical and histological changes as they relate to prolonging the salmon's survival.

During the normal period of spawning, some of the fish were force-fed, others were left unfed, and some were gonadectomized (spayed) and force-fed. In both groups a number of fish eventually resumed voluntary feeding, and they regained their normal coloration. It is hoped that the survival of spawned salmon can be studied more fully as a result of this work.



The Board was informed at its annual meeting in Ottawa on January 5, 1963, that work on the channel is to continue, in preparation for further transplantations in 1963.

The outcome of this experiment will be awaited with much interest. Success in the undertaking could mean the eventual establishment of a pink salmon fishery on the Atlantic coast, thus shifting some of the fishing pressure off the Atlantic salmon. This, in turn, could assist in the replenishment of the Atlantic salmon runs which for some years have been on the decline.

By creating conditions which drastically alter the salmon's normal life-death processes, fisheries research scientists have opened significant new fields of study.

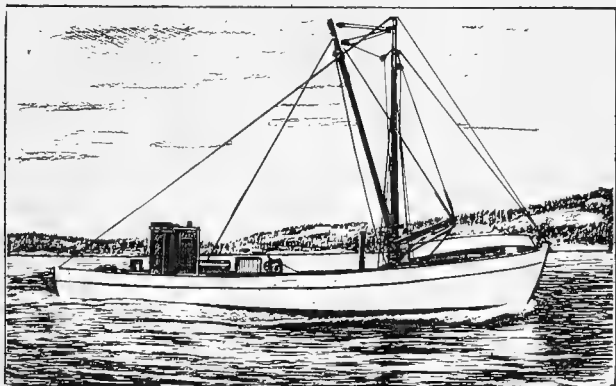
SCALLOP LANDINGS AT ATLANTIC PORTS SET NEW RECORD IN 1962:

Landings of sea scallops at Canada's Atlantic ports increased again in 1962 and established another record. Landings totaled about 14 million pounds of shucked meats valued at about C\$4 million. Both the offshore and the inshore scallop fisheries shared in the increase.

Canada (Contd.):

The bulk of the landings (90-95 percent) were landed again by the offshore fleet which fished almost exclusively on Georges Bank. The increased landings were due to a further build-up of the offshore fleet (39 vessels in 1962 as compared with 28 in 1961). As was predicted, the catch per vessel was down from 1961. However, the ex-vessel price per pound increased and this compensated for the decrease in catch, and earnings should be the same or slightly more than in 1961. Vessel crew sizes in 1962 remained the same or were slightly smaller as compared with 1961.

Staff members of the Fisheries Research Board of Canada made two trips on commercial vessels to sample catches, study mortalities, and make biological observations. Their findings were contained in a report made on January 5, 1963, at the Board's annual meeting.



Typical Digby scallop boat.

The Digby scallop fishery showed an increase in landings in 1962 over 1961. This fishery is in one of its cyclic periods of abundance. Price increases in 1962 provided a further incentive for that fishery.

The outlook for the Canadian scallop fishery continues to be bright. The offshore fleet will probably increase in 1963 to about 50 vessels. Results of limited sampling indicate that the incoming year-class is not particularly strong and is about the same strength as the one that entered the fishery in 1962. Hence the catch per vessel may decrease further in 1963, but total landings may rise slightly due to the increase in fleet size. If the ex-vessel price for sea scallops continues to increase slightly, the earnings per vessel should be about the same in 1963

as in 1962. (Department of Fisheries, Ottawa, January 5, 1963.)

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SHARK MIGRATION STUDIES AIDED BY NEW BRANDING TECHNIQUE:

Branding irons for cattle have been common for many years, but it was only in the summer of 1962 that they were used at sea for the first time. The reason for this and the methods were explained on January 4, 1963, at the annual meeting in Ottawa of the Fisheries Research Board of Canada.

Recent interest in mackerel sharks as food, especially by Norwegian fishermen who have been catching them off Nova Scotia for the Italian market, brought out the fact that very little is known about shark migrations.

In fish migration studies, marking is usually done by attaching some kind of tag or clipping off various combinations of fins. Many of the tags used on large fish are of the dart or fish-hook type; that is, they are held in place by a barb in the meat, while the message is carried in a tube or on a plastic dangle suspended from it. On large fish these are relatively small. Many sharks are cut clear of fishing gear without being boated, so it is important that they be marked conspicuously enough to attract attention in the water alongside the vessel.

Scars on the back or sides of large fish are usually easily seen, so a branding technique was devised by the St. Andrews, New Brunswick, Biological Station of the Board, using letters and figures 1.5 inches high. Twenty-three sharks were marked in 1962. One recapture has been recorded so far--the fish was marked with both a tag and a brand at Corsair Canyon on southeast Georges Bank and re-caught at Hydrographer Canyon about 150 miles to the southwest a month later.

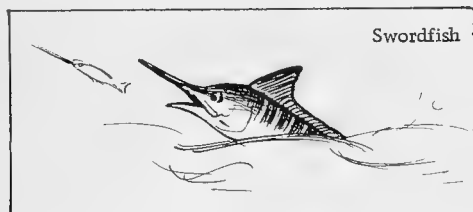
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COMMERCIAL CATCHES OF SWORDFISH BY LONG-LINE IN 1962 VERY GOOD:

The first commercial attempts in Canadian Atlantic waters to combine long-lining for swordfish with the traditional harpoon method of fishing has been successful. In early September 1962, the vessel Dorothea Reeves landed 101 swordfish at North Sydney, Cape Breton Island. Ninety-three of the fish were caught with long-lines. Before the 1962 sea-

Canada (Contd.):

son ended there were at least 32 vessels long-lining for swordfish and preliminary records show that more than 1,500 swordfish were caught by that method. That number represents a landed weight of about 400,000 pounds and a landed value of more than C\$250,000.



One of the great advantages of long-lining swordfish is that the gear can be used at night and when the weather is unsuitable for harpooning, which greatly increases the fishing time per trip. In addition, there is evidence that both male and female swordfish can be caught with long-lines whereas only females are caught with harpoons. It seems possible, too, that long-lining will extend the fishing season by 6 to 8 weeks and provide better opportunity for increased landings.

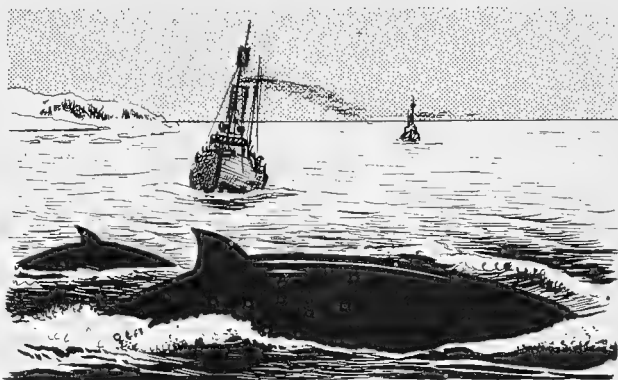
The St. Andrews Station of the Fisheries Research Board of Canada reported at the Board's annual meeting in Ottawa on January 3, 1963, that it has been carrying out long-lining experiments for large pelagic fish since 1960, and has demonstrated the effectiveness of that gear for catching swordfish, tuna, and mackerel sharks, all of which are potentially valuable to the fishing industry. This work will continue in an attempt to learn more of the distribution, abundance, and movements of those species in Canadian waters.

* * * * *

REVIVAL OF BRITISH COLUMBIA WHALING INDUSTRY AIDS BIOLOGISTS:

Biological studies of eastern North Pacific whale stocks by the International Whaling Commission was given impetus in 1962 through the formation of a special committee with specific responsibility in that field. Canada is a member of the Commission, together with a number of other countries with whaling interests. A report on whale studies at the Nanaimo Biological Station, B. C., was presented on January 4, 1963, to the annual meeting in Ottawa of the Fisheries Research Board of Canada.

The resumption of whaling in British Columbia in 1962, after a shutdown lasting two years, provided a source of biological specimens vital to the research program. Fin and sperm whales, which normally predominate



in British Columbia catches, were scarce in 1962 and were dispersed farther offshore than is usual. Sei whales compensated for the reduced catches of fin and sperm in number, but not in oil yield, because the sei is a smaller whale.

No marking was done by Canada in 1962, but one marked sei whale was recovered. It was the first whale mark recovery in British Columbia waters. (Department of Fisheries, Ottawa, January 4, 1963.)

Note: See *Commercial Fisheries Review*, April 1962 p. 42; January 1962 p. 46.



Chile

FISHERY TRENDS, DECEMBER 1962:

A spokesman of the Japanese Embassy in Santiago has announced a visit to Iquique (in northern Chile) of representatives of Japanese firms interested in investing in Iquique. The Embassy also reported that two Japanese firms have requested sites in the industrial section of Iquique for setting up plants to make fish nets.

The rapid growth of the fishing industry in Chile has created a strong demand for new fishing vessels. At the present time, the only vessel building industry in northern Chile is the shipyard operated by a joint United States-Chilean firm in the port of Iquique. The firm, which can build 20 to 24 vessels a year, has all the orders it can handle. It is building all-

Chile (Contd.):

steel vessels. The vessels are equipped with 250 horsepower motors and have an average holding capacity of 100 to 150 metric tons. Several fishing companies are interested in vessels with a capacity of 250 tons which could be used for tuna fishing when plants are expanded to provide canning and freezing facilities. An Antofagasta firm has requested the use of the piers owned by the Corporacion de Fomento de la Produccion de Chile in Antofagasta for the purpose of constructing steel fishing vessels.

The Chilean fishing industry is also seeking independent vessel owners willing to fish under contract. Three United States fishermen recently brought their trawlers to Chile. They are working under contract with a Valparaiso shellfish company fishing for langostino and shrimp. Empresa Pesquera Tarapaca, the integrated fisheries company organized by the Chilean Government, recently announced the delivery of its first vessel, but construction of the firm's fish meal plant

has not started. The vessel will, therefore, fish under contract for one of the privately-owned firms in Iquique.

Representatives of a large United States pharmaceutical firm visited Iquique in December 1962 and indicated that plans are under study for the construction of a plant to produce fish flour for human consumption. An investment of approximately US\$2 million was reportedly under consideration. (United States Consul, Antofagasta, January 2, 1963, and United States Embassy, Santiago, January 24, 1963.)



Denmark

SECOND DANISH-BUILT FISH FREEZING VESSEL DELIVERED TO U.S.S.R.:

The M/S Vitus Bering, the second of four fish-freezing vessels being constructed by a Copenhagen shipyard, for V/O Sudoimport, Moscow, was delivered to the Soviet organi-

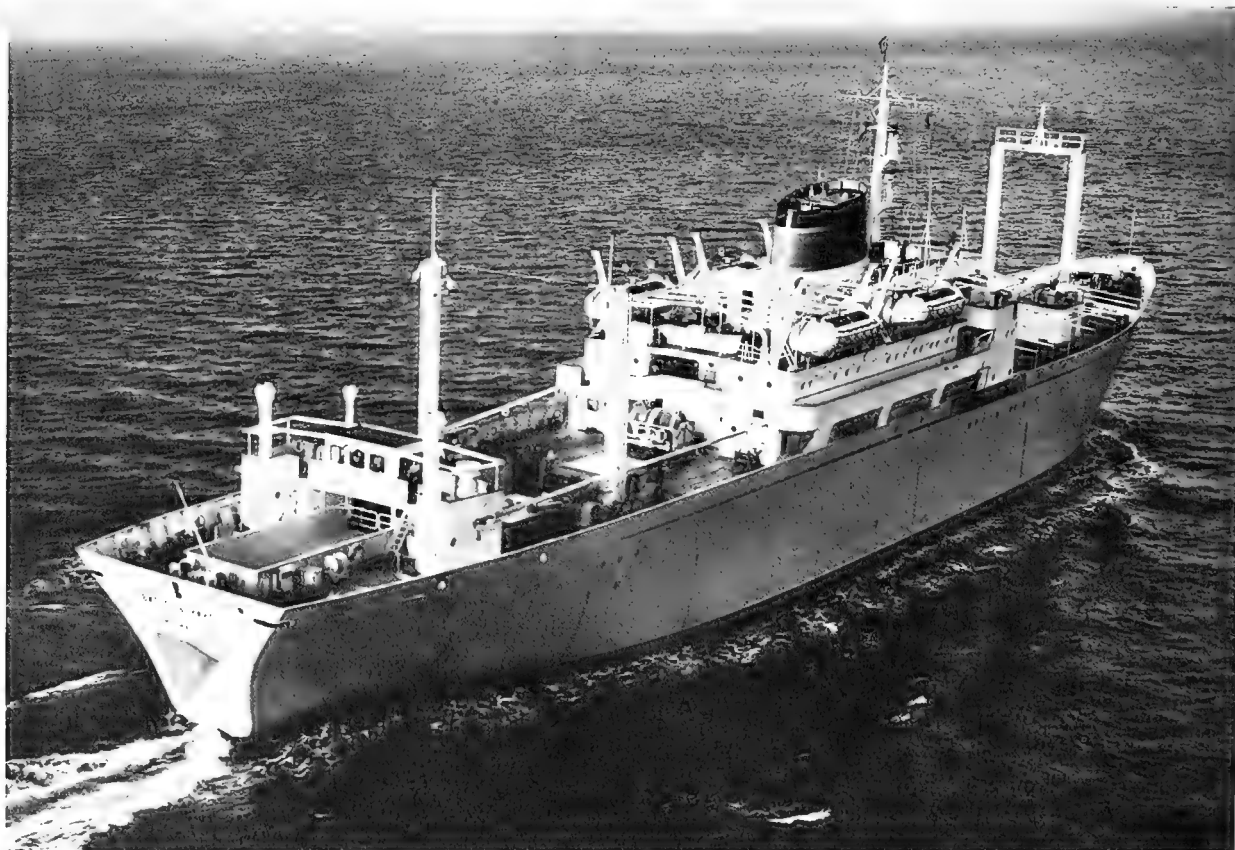


Fig. 1 - Aerial view of the M/S Vitus Bering, fish-freezing vessel built in Denmark for the U.S.S.R. Shows stern ramp for hauling in loaded cod ends and deck layout.

Denmark (Contd.):



Fig. 2 - Another aerial view of the M/S Vitus Bering. Shows the clean modern lines of the new fish-freezing vessel which was assembled from six prefabricated sections in only 19 working days by a Danish shipyard.

zation early in January 1963. The 2,600-ton vessels, identical in size and equipment, receive fish, for dressing and freezing, from accompanying trawlers by way of a stern chute or over the side. The first refrigerated carrier vessel of this group, the M/S Skryplev, was launched on May 10, 1962. (Fisheries Attache, United States Embassy, Copenhagen, January 16, 1963.)

Note: See *Commercial Fisheries Review*, September 1962 p. 71, August 1962 p. 59, and July 1962 p. 104.

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FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JANUARY-NOVEMBER 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first 11 months of 1962 were 19.6 percent greater than in the same period of 1961, mainly because of an increase of 107.4 percent in exports of herring fillets. Exports of flounder and sole fillets increased 8.4 percent, but exports of cod and related species declined 4.3 percent. During the first 11 months of 1962 exports to the United States of fresh and frozen fillets and blocks of about 10.8 million pounds (mostly cod and related species) were up from the exports of about 10.2 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during November 1962 were 26.5 percent above exports in the same month in 1961. Of the total exports, about 169,000 pounds (mostly cod and related species) were shipped to the United States in November 1962 as against 206,000 pounds in the same month in 1961. The leading buyer of frozen fillets in November 1962 was West Germany with 50.0 percent of the total, followed by the United Kingdom with 14.1 percent.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, Jan.-Nov. 1962/

Product	November		Jan.-Nov.	
	1962	1961	1962	1961
Fillets and Blocks:	..... (1,000 Lbs.)			
Cod and related species	1,456	1,250	27,296	28,536
Flounder and sole	2,030	2,126	26,576	24,515
Herring	3,987	2,512	24,298	11,713
Other	40	51	593	1,081
Total	7,513	5,939	78,763	65,845
Industrial Products:	..... (Short Tons)			
Fish meal, fish solubles, and similar products	5,684	2,712	65,500	47,793
1/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.				

Denmark's exports of fish meal, fish solubles, and similar products in January-November 1962 were 37.0 percent greater than in the same period of 1961. Exports to the United States during the period were 110 tons in 1962 as against 28 tons in 1961.

During November 1962, Denmark's exports of fish meal, fish solubles, and similar products were 109.6 percent above the amount shipped out in the same month of 1961. The principal buyers were Finland and the United Kingdom.



El Salvador

EXPORTS OF EDIBLE FISHERY PRODUCTS, 1961:

Shrimp shipments to the United States accounted for 93.5 percent of the quantity and

El Salvador (Contd.):

El Salvador Exports of Edible Fishery Products, 1961			
Commodity and Destination	Quantity	Value	
		Metric Tons	Value
		1,000 Colones	US\$ 1,000
Shrimp, Fresh and Frozen: ^{1/}			
United States	4,089.6	13,937.2	5,574.9
Japan	171.6	545.4	218.2
Honduras	15.4	29.3	11.7
Guatemala	0.3	0.5	0.2
Total shrimp	4,276.9	14,512.4	5,805.0
Shellfish (other than shrimp), Fresh, Frozen, and Cured:			
Costa Rica	7.3	14.2	5.7
Guatemala	52.3	17.5	7.0
Honduras	10.4	10.2	4.1
Other countries	2/	0.1	4/
Total shellfish (other than shrimp)	70.0	42.0	16.8
Fish, Fresh and Frozen:			
Guatemala	5.6	7.8	3.1
Honduras	11.1	10.6	4.2
Nicaragua	0.1	3/	4/
Total fresh & frozen fish	16.8	18.4	7.3
Fish, Cured:			
Guatemala	8.3	10.8	4.3
Honduras	1.3	2.0	0.8
Total cured fish	9.6	12.8	5.1
Fish and Shellfish, Canned:			
Honduras	0.3	1.3	0.5
Grand Total	4,373.6	14,586.9	5,834.7

1/Probably mostly frozen.

2/Less than one-half metric ton.

3/Less than 500 colones.

4/Less than 500 U.S. dollars.

Note: Colones 2.5 equal US\$1.00.

Source: *Anuario Estadístico*, 1961, Vol. 1, El Salvador.

95.5 percent of the value of El Salvador's total exports of edible fishery products in 1961.



Faroe Islands

EXPORTS OF FROZEN FISH FILLETS, JANUARY-SEPTEMBER 1962:

Exports of frozen fish fillets from the Faroe Islands during January-September 1962 were up 120.0 percent in quantity and 78.1 percent in value from those in the same period of 1961. The increase was due mainly to the development of markets in East Germany and Hungary and larger shipments

Faroe Islands Exports of Frozen Fish Fillets, January-September 1962-61						
Country of Destination	Jan.-Sept. 1962			Jan.-Sept. 1961		
	Qty.	Value		Qty.	Value	
	Metric Tons	Kr. 1,000	US\$ 1,000	Metric Tons	Kr. 1,000	US\$ 1,000
United States . . .	188	592.0	85.6	334	1,099.0	159.0
United Kingdom . .	304	825.0	119.4	56	152.0	22.0
East Germany . . .	251	539.0	78.0	-	-	-
Hungary	100	211.0	30.5	-	-	-
Denmark	11	38.0	5.5	4	12.0	1.7
Sweden	13	44.0	6.4	-	-	-
Total	867	2,249	325.4	394	1,263.0	182.7

Note: (Danish) krone 6.911 equals US\$1.

to the United Kingdom. On the other hand, exports to the United States were down 43.7 percent in quantity and 46.1 percent in value. The value of the exports in 1962 did not increase as much as the quantity because of the decline in the higher-priced shipments to the United States. (*Faroes in Figures*, No. 20, December 1962.)



France

JOINT JAPANESE-FRENCH TUNA BASES IN SOUTH PACIFIC APPROVED:

The French Government's Foreign Investment Committee, composed of the Finance Ministry and the Overseas Ministry, is reported to have approved, in principle, establishment of the joint Japanese-French tuna bases in Tahiti and New Caledonia, as originally proposed by a large Japanese fishing company in early 1962. Formal approval by the French Government was expected to be given in a matter of weeks.

The proposed joint tuna enterprise at New Caledonia will be located on 72,000 square meters of land in the bay located nearby the capital city of Noumea, with French interests contributing 51 percent of the investment and the Japanese fishing company 49 percent. Base facilities will include a 2,000-ton capacity cold-storage plant and a freezer unit capable of quick-freezing 50 metric tons of tuna a day. In addition, docking facilities, living quarters, and storage areas will be constructed.

The Japanese firm plans to contract about 40 Japanese fishing vessels to fish out of the New Caledonia base and reportedly will pay the same prices for tuna as those paid by the United States cannery in Samoa.

The proposed joint tuna base at Tahiti is to be constructed at Papeete. Parties to this joint venture, in addition to the same Japanese fishing company, are a large United States tuna packing company and a French company. Plans call for constructing a 2,000-ton capacity cold-storage plant at Papeete which would be used to store tuna for transshipment to the United States tuna company's packing plant in the United States. (*Suisan Keizai Shimbun*, January 11, 1963, and other sources.)

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MESH SIZE REGULATION FOR OTTER TRAWLS IN NORTHWEST ATLANTIC FISHERY:

A decree of January 1, 1963, specified that French vessels fishing in the Northwest Atlan-

France (Contd.):

tic for cod, haddock, and certain flatfish may not use otter trawls of a mesh finer than 114 millimeters (4.5 inches). Vessels trawling for other kinds of fish may use finer nets if their incidental catch of the specified species does not exceed certain percentages, mostly 10 percent. This decree is said to follow the recommendations of the 1961 session at Washington, D. C., of the Northwest Atlantic Fisheries Commission. (United States Embassy, Paris, January 12, 1963.)

Note: See Commercial Fisheries Review, September 1961 p.61.

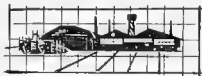


Greenland

FIRST PRIVATELY-FINANCED FISH-PROCESSING FIRM:

The establishment of a new fish-processing firm in Greenland as a joint venture of fishing industry interests in Greenland, Denmark, and the Faroe Islands marks the first step toward large fishery operations by private enterprise, rather than by the Royal Greenland Trade Department (a Danish governmental unit). The Department stimulated the development of the new company, which will fillet and freeze fish for the United States market and produce fish meal from fillet waste and, in season, from capelin.

Beginning in August 1963, the firm's new plant is expected to produce 40,000 pounds of fillets daily. (United States Embassy, Copenhagen, January 23, 1963.)



Hong Kong

FISH FARMING ADDS TO FOOD SUPPLY:

The constantly increasing population (rose from 1.5 million to 3.5 million in past ten years) of Hong Kong has posed serious problems of employment and food supply. However, the ingenuity and industry of the Chinese, who are even growing vegetable crops in the sand of the seashore, are helping to cope with the problem. And so are the experts of Hong Kong's Department of Agriculture and Forestry through its experimental stations in livestock, forestry, crops, and fisheries. Among the programs to provide

more protein, that of fish farming has been very encouraging.



Fig. 1 - How the embankments, causeways and fish ponds are built. Men cut the heavy, greasy clay and women slide it along ramps to be built up into causeways and banks to contain the ponds.

"In fact," said the Director of Agriculture and Forestry, in an interview with a Food and Agriculture Organization correspondent, "the acreage under fish ponds has almost doubled in the past two years, from about 600 to something like 1,100 acres."

Fish farming is increasing employment of the poorer classes of workers and adding to the income of the investors. It is also leading to a bigger supply of fish to the local market. On average, a pond of one acre yields around one ton of fish a year, a harvest which brings in, roughly speaking, a gross of about \$HK.5,000 (US\$875). The total value of the annual production from fish ponds in Hong Kong is now over \$HK.5 million (US\$875,000).



Fig. 2 - Some of the fish ponds that have been developed in the new territories area. The acreage under fish ponds has almost been doubled in the past two years, from about 600 to around 1,100 acres.

Hong Kong (Contd.):

"As most of the fish farmers have between 3 and 6 acres of ponds, you can appreciate that fish farming is a worthwhile business," the Director stated. "But, of course, the farmers and their families also keep chickens and ducks, perhaps a pig or two and a water buffalo or other cattle, all of which adds to their standard of living."

The Chinese, who have practiced the art of fish culture for many centuries, obtain very high yields. Chiefly they cultivate grey mullet and various species of carp--grass, silver, mud, black, and common carp, for example. The number of fish that can be raised per acre depends on the fertility of the pond. They have also developed the art of raising pond fertility to a high level. They usually stock an acre of water with about 10,000 grey mullet fry and about 2,000 Chinese carp fry. Mortality rates are high due to a variety of causes, but the ultimate yield of fish per acre is also very high--probably the highest in the world.

The Hong Kong fish farmers have learned how to raise marine fish, the grey mullet, fresh-water fish, and the grass and several other species of carp, in brackish water. This calls for considerable skill and knowledge in maintaining a proper salinity value tolerable to both kinds of fish. And it is in such circumstances that science comes to the aid of the fishermen through the work of the Pond Fish Experimental Unit. This body of the Department of Agriculture and Forestry is concerned, among other things, with water analysis.

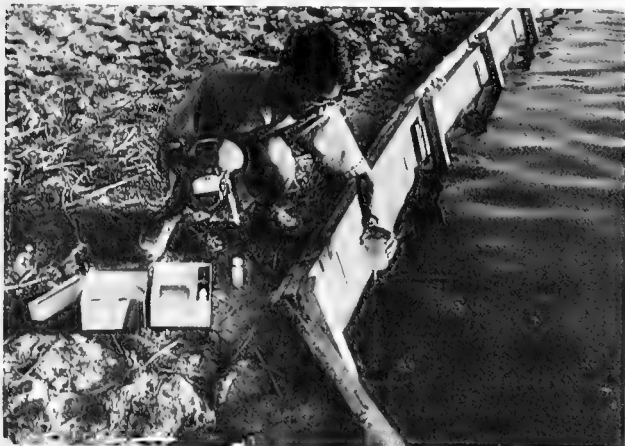


Fig. 3 - A biologist from the Freshwater Fisheries Experimental Unit of the Department of Agriculture and Forestry, Hong Kong, making a salinity test.

"Such work provides a useful service to the fish farmers," said the Director. "They no longer have to rely entirely on their own judgement but can, in effect, exercise scientific control."

The Pond Fish Experimental Unit has a big program of work and in order to carry this out it is expanding. The Unit started with two ponds and will shortly have 20 which will make it possible to carry out replicated trials. This is important as it will make possible accurate statistical analysis of results. The Unit also works on such problems as the growth rate of fish, the effects of different fertilizers on pond fertility, and other problems.

"The high yield of protein per acre from fish farming makes it particularly important in a crowded area such as Hong Kong where industrial and urban development encroaches on the limited amount of arable land available," the Director stated. He added, "fish farming which yields about \$HK.5,000 (US\$875) per acre makes excellent use of land that would otherwise yield only \$HK.300 (US\$52.50) if given to sea grass or brackish paddy. We are therefore doing our best to encourage fish farming but, of course, there is capital outlay involved. Although it costs a few thousand dollars to construct a fish pond, most fishermen haven't any capital. If, for example, we could obtain financial support under the Freedom From Hunger Campaign, we could help many more refugees and others to set up as fish farmers."

He pointed out that the Hong Kong Government had already carried through many land reclamation schemes for housing and industry. However, it would be possible to reclaim land from the sea for fish farming but that would need capital investment on a large scale.

"I cannot say how much would be needed before making a complete investigation and survey," he concluded. "But such a scheme, if carried through, would provide land for the settlement of some thousands of families and would, through fish farming and agriculture, help to feed Hong Kong's millions."



Iceland

FISHERY TRENDS, EARLY JANUARY 1963:

Winter Herring Landings: The herring catch on the southwest coast of Iceland, through January 5, 1963, amounted to 80,146 metric tons, compared with 74,999 tons taken by January 6, 1962. About 131 vessels were fishing for winter herring this season compared with 108 the previous year. According to Icelandic press reports, there has been some slowdown in herring landings because the reduction plants were unable to handle the load.

Two Groups Interested in Buying Inactive Reduction Plant: A group of 20 to 30 fishing vessel owners have expressed an interest in buying a reduction plant located in the inner harbor of Reykjavik, according to the newspaper *Althydubladid*. The processing capacity of the plant is about 337 tons per day. The State herring reduction plants in the north are also reported to be interested in the plant. The plant was built with United States Marshall Plan Funds but was never operated since its construction because of faulty machinery discovered during the trial run and also the lack of incentive resulting from a number of years of poor herring catches. The factory is partly owned by the City of Reykjavik and partly by private parties. The very favorable location of the factory would permit trawlers to unload their fish directly into the factory from the pier. The only other reduction plant in the Reykjavik area requires a 15-minute run by truck, which increases the cost considerably.

Retail Fish Prices Increase: As a direct result of the recent increases announced by the Fish Pricing Board, retail sales prices of fresh fish (excluding herring) increased 9.5 to 17.5 percent. (United States Embassy, Reykjavik, January 11, 1963.)

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FISHING FLEET AND ESTIMATED FISHERY LANDINGS, 1961-62:

The total tonnage of Iceland's fishing fleet in 1962 was 1.9 percent greater than in 1961 in spite of a small cutback in the trawler fleet. Fishing vessels accounted for 53.3 percent of the tonnage of all vessels registered in Iceland. A total of 26 Icelandic vessels with a combined tonnage of 1,685 gross registered tons were lost at sea, ran aground, or drifted ashore in 1962.

Size of Icelandic Fishing Fleet, 1962-61				
Type of Vessel	1962		1961	
	Number of Vessels	Gross Registered Tons	Number of Vessels	Gross Registered Tons
Trawlers	47	32,816	48	33,470
Other fishing and whaling vessels of over 100 g.r.t. . .	111	18,206	100	16,246
Other fishing vessels under 100 g.r.t.	676	23,591	657	23,539
Total	834	74,613	805	73,255

The Director of the Fisheries Institute of Iceland, estimated that Iceland's total fishery landings amounted to 820,000 metric tons in 1962. According to preliminary data, the total catch in 1961 amounted to 710,000 tons. (Data based on round or whole weight of fish.) The herring catch in 1962 totaled 473,000 tons, up 45.1 percent from the herring catch of 326,000 tons in 1961, according to the newspaper, "*Althydubladid*." The estimated fishery landings in 1962 indicate a decline in the catch of species other than herring. The shellfish catch in 1962 was estimated at 2,900 tons,

about the same as in 1961. (United States Embassy, Reykjavik, January 11, 1963.)

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FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-AUGUST 1962:

Species	January-August	
	1962	1961
. . . (Metric Tons) . . .		
Cod	162,765	171,764
Haddock	24,445	23,460
Saithe	7,669	7,434
Ling	4,605	3,900
Wolffish (catfish)	11,335	11,079
Cusk	3,696	3,586
Ocean perch	9,655	20,508
Halibut	975	1,106
Herring	382,235	248,600
Shrimp	349	430
Other	8,540	8,215
Total	616,269	500,082

Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-AUGUST 1962:

How Utilized	January-August	
	1962	1961
. . . (Metric Tons) . . .		
Herring ^{1/} for:		
Oil and meal	301,210	179,779
Freezing	18,138	10,204
Salting	54,843	54,498
Fresh on ice	7,718	4,119
Canning	336	-
Groundfish ^{2/} for:		
Fresh on ice landed abroad . . .	14,559	16,960
Freezing and filleting	108,597	118,049
Salting	67,283	63,545
Stockfish (dried unsalted)	31,940	42,495
Home consumption	7,338	5,595
Oil and meal	1,693	2,998
Shellfish for:		
Freezing: Lobster	2,274	1,410
Shrimp	263	304
Canning (shrimp)	86	126
Total Production	616,269	500,082
1/ Whole fish.		
2/ Drawn fish.		

* * * * *

FRESH FISH EX-VESSEL PRICES ESTABLISHED FOR 1963:

Ex-vessel fresh fish prices, effective January 1, 1963, have been established by Iceland's Fish Pricing Board. The average price increase is 9½ percent. Top-grade cod and haddock were increased 12½ percent or from 3.21 kroner per kilogram (about 3.36 U. S. cents a pound) to 3.60 kroner per kilogram (about 3.80 cents a pound). The

Iceland (Contd.):

price increases for fish of lower quality were smaller. (United States Embassy in Iceland, January 3, 1963.)

Note: Values converted at rate of 1 kroner equals 2.32 U. S. cents.

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HERRING LANDINGS VERY GOOD THROUGH DECEMBER 1962:

Aided by favorable weather conditions, Iceland's southwest coast herring catch through the end of 1962 was reported very good. If the same number of vessels continue to fish and if the weather continues favorable through January, it is predicted that the herring catch will be large enough to tax the capacity of the southwest coast reduction plants.

The contract recently concluded with the Soviet Union for southwest coast herring specifies a minimum 15 percent fat content and the catch through December 1962 was running at about that minimum.

**India**

COLLABORATION SOUGHT FOR NEW FISH AND SHRIMP PROJECT:

Financial and technical collaboration is still being sought by the Gujarat Fisheries Central Cooperative Association, Ltd., of Ahmedabad, India, for a commercial fisheries project it plans to establish at Okha Port on the Saurashtra coast of Gujarat State, India. The project envisages the employment of five medium mechanized vessels to exploit the shrimp resources of the Gulf of Kutch and two trawlers to carry on offshore fishing in the Arabian Sea. In addition, two transport launches are proposed to be bought to bring fish landed in the adjoining fish harbors by other fishermen.

The project will, moreover, include the establishment of fish canning, quick freezing, cold-storage, and fish meal plants. Besides exploiting the domestic markets in the principal cities such as Bombay and Delhi, efforts will also be directed to export processed fish to the United States, Germany, and other foreign countries.

The Gujarat Association is the largest fishermen's cooperative in India and the Gulf of Kutch is believed to offer considerable scope for shrimp fishing.

Note: See *Commercial Fisheries Review*, May 1962 p. 51.

**Indonesia**

FIRST FROZEN TUNA EXPORTS TO UNITED STATES:

The first exports of frozen tuna to the United States by the Indonesian General

Management Board of State Fisheries were made on January 7, 1963. The exports, amounting to 40 metric tons, were made under the production-sharing contract between an Indonesian firm and a subsidiary of a large United States tuna canning firm.

In a formal ceremony marking the occasion, the Minister for Agriculture and Agrarian Affairs remarked that, although the first shipment was small, it was significant as the first result of a production contract in the field of fisheries. (United States Embassy, Djakarta, January 11, 1963.)

**Japan**

ATLANTIC OCEAN FISHING CONDITIONS AND FROZEN TUNA PRICES:

Japanese albacore fishing in the Atlantic Ocean improved greatly in December 1962, and it was hoped that good fishing would prevail through January 1963. Reportedly, albacore tuna presently constitute 70-80 percent of tuna caught by vessels fishing in the South Atlantic.

Prices of frozen albacore tuna for export to the United States from the Atlantic Ocean fishery had recovered as of early January 1963. Reportedly, over \$320 per short ton was being paid for albacore unloaded at Las Palmas, Canary Islands, for transshipment to United States American canneries in Puerto Rico.^{1/} As for the European tuna market, albacore tuna were being exported almost wholly to Yugoslavia at \$420 per metric ton, c.i.f. Hamburg. (Suisan Tsushin, January 11, 1963.)

^{1/}Mid-January 1963 information indicates that \$315-\$320 per short ton was being paid for albacore landed at Las Palmas.

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CANNED TUNA PRICES:

The Japan Canned Foods Exporters Association's canned tuna sales committee, on January 8, 1963, conducted its first canned tuna export price negotiations of the year with the Canned Tuna Sales Company (representing packers). At the meeting, the Exporters Association sought agreement from the packers for a drastic price reduction of \$1 per case (48 7-oz. cans) for canned white meat tuna in brine and an 80-cent-per-case reduction for canned light meat tuna in

Japan (Contd.):

brine.^{1/} However, the packers gave no definite reply at the meeting.

On January 17, the directors of the Japan Canned Tuna Packers Association met to discuss the price adjustments sought by the canned tuna exporters. Although no agreement was reached, opinions expressed at the meeting indicated strongly that the packers would not agree to the drastic price reductions. (Suisan Tsushin, January 10 & 19, 1963.)

^{1/}Editor's Note: The most current price information for Japanese canned tuna is for September 1962 (Tenth Sale). At that time, white meat tuna in brine sold for \$10.40 per case and light meat tuna in brine \$7.80 per case (all prices f.o.b. Japan).

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PRICE RESTRICTIONS ABOLISHED ON FROZEN TUNA FOR EXPORT TO U. S.:

On October 22, 1962, the Japan Frozen Food Exporters Association opened a meeting of its tuna department for a discussion of the sales policy applied to the United States. As a result, the interfirm conference prices of \$340 a short ton f.o.b. for albacore and \$290 for yellowfin, which had been established in September 1962, were abolished.

At the same time, the system of bottom or floor prices for exports to the United States, which had been fixed at \$350 for albacore and \$310 for yellowfin, were also abolished.

Thus, export prices of frozen tuna for export to the United States are now free of restrictions, but the Association intends to examine means of stabilizing prices in close cooperation with the producers. (Japanese periodical, October 24, 1962.)

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DESCRIPTION OF TUNA CATCH STATISTICS:

A speech titled "Investigation for Tuna Catch Statistics," by Noriaki Oka, Chief, Fisheries Statistics Section, Statistics and Survey Division, Ministry of Agriculture and Forestry, was made at the Second Japan-United States Tuna Conference held at Tokyo in October 1962. Oka was a member of the Japanese delegation on Committee I, which discussed current trends in tuna production and forecasts for the tuna resources, expanded utilization of tuna fisheries, and measures to improve bilateral exchange of current information.

The text of the speech as translated from Japanese follows:

"Introduction: Statistics on fisheries have been considerably improved and expanded in Japan after World War II, but the users of statistics in our country are still clamoring for improvement. We are therefore continuing our efforts to fulfill this need. Particularly, in recent years, we have made progress in compiling comprehensive statistics for the agricultural and fishing industries. We are making an effort to compile fishery statistics which would include, in addition to catch data, general information on fish prices, profits and expenses of fishery management units, and on the living standards of the people engaged in fishery.

"In Japan, there are an extremely large number of small-scale coastal fishery operators, and they make up 90 percent of all management units. Even in the case of the tuna fishery, which is one of the larger distant-water fisheries, the small coastal fishery operators make up one-third of the management units. Production of these small coastal fishery management units is naturally small, but the improvement of their operations is an important domestic problem in Japan. Therefore, there is a need for compiling, in general, similar types of statistics for the coastal fishery. Moreover, with the exception of the census survey, statistical research for fishery, like that for agriculture, is almost entirely undertaken by the national statistical survey agencies. In these national statistical investigations, data requested by local autonomous bodies, such as prefectures, must be provided to a certain extent also.

"As can be expected, the above-mentioned situations contribute to abundance in kinds of fishery data. Moreover, the collection of such data requires a large staff of workers due to the fact that there are very many places and numerous species of fish to be investigated. Consequently, it is possible that we are not compiling comprehensive statistics for the important fisheries, particularly the tuna fishery.

"In our investigation of important fisheries, we are presently studying the possibility of confining our work areas to principal fish landing ports and establishing a system whereby only certain important items can be investigated, with special rapidity and accuracy, and promptly reported. At the same time, we also hope to make use of all reliable data that can be administratively collected through the Fisheries Agency, such as data from the mothership-type fishery and those fisheries involving landing of catches in foreign countries.

"Before proceeding with the explanation of investigation methods used in collecting data for tuna catch statistics, as background information I have briefly described the changes that are taking place in the compilation of fishery statistics in Japan. I would like to explain just one more item concerning tuna fishery statistics, which I believe will facilitate the understanding of investigation methods used in Japan for the compilation of tuna catch statistics.

"At the present time, the following kinds of fishery statistics are being collected:

"I. Tuna Statistics:

"A. Catch statistics (quantity of catch or landing, actual operational units, number of vessel trips, number of days per trip). These data are obtained from the following sources:

Japan (Contd.):

- "1. Domestic marine fisheries (surveyed by the Statistics and Survey Division, Agriculture and Forestry Ministry).
- "2. Factoryship-type fisheries (each vessel is investigated by the Fisheries Agency).
- "3. Vessels based at foreign ports (each vessel is investigated by the Fisheries Agency).
- "4. Vessels operating in the Atlantic Ocean (each vessel is investigated by the Fisheries Agency).

"B. Fishery census (management units, number of vessels in operation, vessel crews at peak of fishing season, number days fished, number of men engaged in fishing operations, etc.).

A national fishery census survey is conducted every ten years by the Ministry of Agriculture and Forestry and by government agencies in prefectures, cities, towns, and villages.

"C. Management income and expense statistics (income, expenditure, assets, number of work days, etc.).

This survey is conducted by the Statistics and Survey Division and by the Fisheries Agency both of the Ministry of Agriculture and Forestry, fishery schools, and fishery cooperative associations, but the data are inadequate and generally unusable.

"D. Fish prices (average prices paid or prices most frequently paid at production and consumer centers).

Data compiled by the Statistics and Survey Division, Ministry of Agriculture and Forestry, and market organizations.

"E. Classification of use at landing places, fresh fish distribution network, quantity of processed fish. (Note: Collection of data on classification of use was started in 1962.)

Data compiled by the Statistics and Survey Division, Ministry of Agriculture and Forestry, and fishery products inspection associations.

"F. Consumption statistics (quantity and value of purchases).

Data compiled by the Statistics and Survey Division of the Ministry of Agriculture and Forestry, Welfare Ministry, and the Statistics Bureau of the Prime Minister's Office.

"G. Trade statistics (volume and value of trade).

Data compiled by the Ministry of Finance and the Ministry of International Trade and Industry.

"II. Structure of Organizations Collecting Tuna Catch Statistics:

"As previously stated, the Statistics and Survey Division of the Ministry of Agriculture and Forestry conducts most of the statistical investigations for the tuna fishery. This Division not only compiles various fishery statistics, but also conducts statistical investigations for the agricultural and livestock industries. The organizational structure of this Division is as follows:

"Central Office:

Statistics and Survey Division, Ministry of Agriculture and Forestry.

Number of offices: Five departments and three sections.

Staff: 500 (50 concerned with fishery statistics).

"Prefectural Offices:

One statistical and survey office in each prefecture, each with six departments.

"Hokkaido:

Four statistical and survey offices, each with six departments

Total number of regional (Prefectures and Hokkaido) fishery offices: 49.

Total staff members of regional fishery offices: Approximately 4,000 (287 concerned with fishery statistics).

Town and Village Offices: One in each fishing town or village.

Total number of offices: 787.

Total staff members of town and village offices: Approximately 8,500 (826 concerned with fishery statistics).

"The staff members, who are all experienced in statistical work, are given opportunities for on-the-job training. About 250,000 private individuals familiar in fisheries are assisting in the Government's statistical research on a part-time basis.

"Statistical investigations for the tuna fishery are undertaken by the following disciplines of the Ministry of Agriculture and Forestry:

"Central Office:

Fishery Catch Statistics Section, Fishery Statistics Department, Statistics and Survey Division.

"Prefectural Offices:

Fishery Catch Subsection, Fishery Catch Statistics Section, Fishery Statistics Department, Statistics and Survey Division.

"Coastal Suboffices:

Chief, Fishery Statistical Office.

"Statistical investigation of the tuna fishery was authorized in 1952 by the Director, Administrative Management Agency, in accordance with Designated Statistics Ordinance No. 54, based on

Japan (Contd.):

the Statistics Law of Japan, and, as such, tuna statistics are included within the list of important fishery statistics.

"III. Investigation Methods for Compilation of Tuna Catch Statistics:

"A. Summary:

"Statistical investigation methods for the tuna fishery, as well as those for other fisheries, have undergone several changes, each change bringing about a modification of the investigation system.

"In Japan, statistical investigation of fisheries on a national scale was started in 1870. Subsequently, the mayors of cities, towns, and villages submitted annual statistical reports to the Statistics Section of the Ministry of Agriculture and Forestry through the prefectural governor. This system continued until the termination of World War II. Statistical agents in cities, towns, and villages collected data on quantity of fish catch and on number of people engaged in fishery by different methods, and tabulated these data on the report form prescribed by the Ministry of Agriculture and Forestry. However, under this system of collecting data, wherein the methods of collection were never criticized, variations occurred in the tabulated catches, which were questionable, so, to avoid this situation, the regional statistical offices began to submit to the Ministry figures showing less fluctuations than those which actually existed.

"After the termination of World War II, fishery products were placed under a ration system and all local catches were delivered to a central point for distribution to consumer centers. Fishery associations were required to submit monthly production reports to the Government, and on the basis of these data, the Government compiled fishery statistics. However, for statistical purposes, the reports submitted by the fishery associations, which were compiled for business purposes, were unsuitable since they lacked statistically important data, they were submitted too late, or contained numerous omissions and incomplete data, due to administrative defects.

"In 1950, the Fishery Statistics Section was established in the Statistics and Survey Division of the Ministry of Agriculture and Forestry, and experts in fishery statistics were assigned to all the regional statistical survey offices, as well as suboffices. This marks the beginning of the fishery statistical investigation system as it generally exists today.

"Under this system, in the beginning a method was instituted whereby a few

incoming vessels were selected for sampling, and their catches actually inspected or determined by interviewing the vessel master. However, this method was subsequently found to be impractical, so it was discontinued and substituted by another method of tabulation whereby records of fish unloaded and received by fishery cooperative associations and fish wholesale markets were checked against catch data obtained from actual inspection of certain selected vessels or against data obtained from catch report forms issued to certain vessels. At present, this method is also virtually in disuse.

"B. Present method of investigation:

"1. Catch information:

"Depending upon quantity of fish unloaded at a port, the statistical agent conducts investigations under one of the following two methods, which are the only methods being employed in the compilation of tuna catch statistics.

"a. At major fishing ports, examines and tabulates all fish landing records (sales slips).

"b. In fishing villages, estimates catch by interviewing members of fishery cooperative associations.

"Under the interview method, there are two methods by which fish landings are investigated. They are:

"(1) In cases where it is not possible to calculate catch by tabulating every sales ticket, an interview is conducted to determine numbers and kinds of vessels engaged in actual fishing. With this as a basis, a certain number of fish tickets are sampled to determine catch composition by kinds of vessels, and from these two sets of figures, total catch is estimated for the different species by kinds of vessel.

"(2) In the case where sales slips are not employed in tabulating catch statistics, an interview is conducted to determine numbers and kinds of vessels engaged in actual fishing. Then, with this as a basis, a fishing association within a fixed area is selected for sampling and interviews conducted to obtain an estimate of total catch by species and by kinds of vessel.

"There are 3,000 fish landing ports in Japan. Of these, 150 ports are checked

Japan (Contd.):

by the sales ticket system, as described in "a." Of these 150 ports, about 30 handle tuna. Fishing ports investigated under the interview system, as described in "b(1)" and "b(2)," number close to 2,800, of which about 10 percent handle tuna.

"Recently, sales slips have begun to be used at all landing ports. In the case of the tuna fishery, statistical workers are employing the sales slip tabulating method described in "b(1)" more widely than the straight interview method described in "b(2)" above.

"Fish landing records are prepared by licensed fishery cooperative associations or fish markets at time of unloading, based on mutual agreement with vessel owners. These records, which are also used to compute fishermen's shares, are reliable, but the statistical workers make further checks by comparing them with other data to verify their accuracy.

"The fishery cooperative associations are public enterprises established in fishing villages. They not only undertake such functions as loans, sales, purchases, and rental of equipment, but also conduct guidance and adjustment for fishermen engaged in the coastal fishery. Organized on the village level according to type of fishery, the fishery cooperative associations always have detailed information on production. However, at times catch data provided by the associations are further studied by statistical workers by comparing them with other data.

"2. Number of vessels in operation, number of trips, and number of trip days:

"The number of vessels fishing is obtained by interviewing vessel owners. At times, vessels which normally return to large ports enter prefectural ports, where vessel operations are not tabulated. (In 1961, a total of 2,629 tuna vessels were engaged in fishing.)

"In tabulating number of trips, the number of fishing vessels entering landing ports is recorded. At major landing ports, this is done by tabulating sales slips. In fishing villages, this data is obtained by interviewing fishery cooperative associations and from reports submitted by part-time statistical agents. (In 1961, the number of trips made by tuna vessels totaled 27,000.)

"The number of trip days is computed by multiplying the number of days per trip with the number of trips. At large fish landing ports, this information is

obtained by interviewing masters of incoming vessels or fish buyers at the market. (In 1961, the number of trip days for tuna vessels totaled 380,000 days.)

"Mention should be made at this point concerning statistical tabulations by fishing grounds. In addition to those statistics which are tabulated by large areas, detailed catch statistics by fishing area have been specially prepared for squid, saury, and mackerel. We have compiled catch statistics by five-degree areas for tuna vessels (over 30 gross tons) which operated during the period between April 1961 and March 1962. In April 1962, we compiled statistics for the first half of fiscal year 1961 (April 1961-March 1962) and are now tabulating the data for the second half of 1961. . . ."

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PACKER'S VIEWS ON TUNA PROBLEMS:

The Executive Director of Japan Export Tuna Packers Association was interviewed on January 12 by a reporter of the Japanese fisheries periodical, Suisan Tsushin, concerning problems confronting the Japanese tuna canning industry. His views on yield, inspection standards, sales prices, supply of raw materials, and on marketing are reported to be substantially as follows:

Yield: The standard yield of Japanese summer albacore tuna is 50 cases (48 7-oz. cans) per metric ton of albacore with fish averaging 18 kilograms (39.6 lbs.) in weight. Yield of winter albacore depends upon the quality of fish, but is based on the average fish weight of 20-22 kilograms (44-48.4 lbs.).

It is common knowledge that, . . . in terms of quantity, yield in the United States is much higher than that in Japan. Extent of this difference in yield depends on type of raw product and processing method, but it can be assumed that United States packers pack at least 5-6 more cases of canned tuna per ton of raw fish than Japanese packers.

If United States packers can pack 62 cases of canned tuna per ton of raw tuna, then the difference in Japanese and United States yield would widen to 12 cases per ton of fish. . . . There is no doubt whatsoever that Japanese packers can obtain much higher yields than United States packers if they were to follow the American packing method and not discard any meat portions in the packing process.

Inspection Standards: In Japan, inspection standards compel tuna packers to improve the quality of their pack. The spirit of the inspection standards, which was established before World War II for albacore tuna, even when they sold at extremely low prices, is still in existence today. . . .

The strict inspection standards applied in Japan seem to be out of line in these days when cost of raw materials is so high. Therefore, they should be revised and brought in line with standards in the United States. . . .

Export Prices: An objective appraisal of the quality of Japanese canned tuna indicates that a suitable price for Japanese tuna packed in brine would be about \$18 per case (48 7-oz. cans). Before World War II, Japanese canned tuna was retailing in the United States at almost the same price as well-known United States brands. Since Japanese canned tuna is very high in quality and its production regulated, we would like to see it exported at prices at least comparable with name American brands.

Japan (Contd.):

In the early postwar period, Japanese canned solid-pack tuna could be exported only at prices of chunk-style packs. However, due to subsequent efforts of Japanese exporters, coupled with the rising cost of raw materials, Japanese canned tuna began to sell at prices comparable to, or even higher than, United States private label packs. We hope that the exporters will exert still greater efforts to enhance Japanese canned tuna prices.

Supply: A study of the tuna supply situation reveals the existence of a constant supply shortage of albacore tuna in the world market. The demand for albacore tuna is very strong in Europe and the United States. However, price disruption in Japanese frozen tuna exports to the United States occurs about once or twice a year, without fail. . . Also, prices of frozen tuna exported from Japanese overseas bases are said to be lower than those exported from Japan proper, although we do not have detailed information concerning this matter. It would be very unfortunate if those two factors are contributing unnecessarily to the deterioration of the United States tuna market.

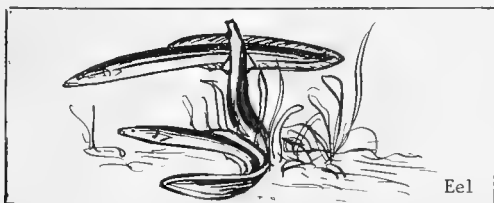
United States Canned Tuna Market: In the United States, canned tuna retail prices are relatively stable during the months of September, October, and November. Wholesale prices may fluctuate in certain regions of the United States where promotional sales are conducted. Those sales are conducted regularly. It seems that the prices of Japanese canned tuna sold in the United States still leave good margins, as calculated from c.i.f. prices. If those extra margins could be properly used to expand markets for Japanese canned tuna, that would indeed be desirable.

Sales Policy: Although every effort is being made to improve sales methods, Japanese canned tuna probably can be exported at better prices and in greater quantities if Japanese packers and exporters would fully apply the agreement they have on canned tuna sales (50-50 division of export quota). At this time when the Japanese Government is viewing with concern restrictions placed on tuna by GATT (General Agreement on Tariffs and Trade), which the Government considers excessive, we must not, under any circumstances, allow the United States canned tuna import quota (at the 12½-percent rate of duty) to remain unfulfilled. (Suisan Tsushin, January 14, 1963.)

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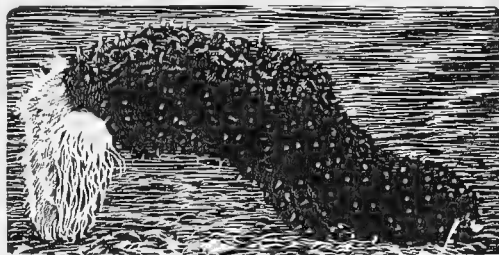
FISHING FOR TUNA IN SOUTH PACIFIC OCEAN PROMISING:

The Japanese fishing firm which planned to build tuna fishing bases on both Tahiti and New Caledonia in the South Pacific has already obtained permission from the French and local governments, and also submitted a petition to the Japanese Fisheries Agency for approval. The plan was being studied by the Japanese Government and the general consensus was that permission to build the base would be granted.



Eel

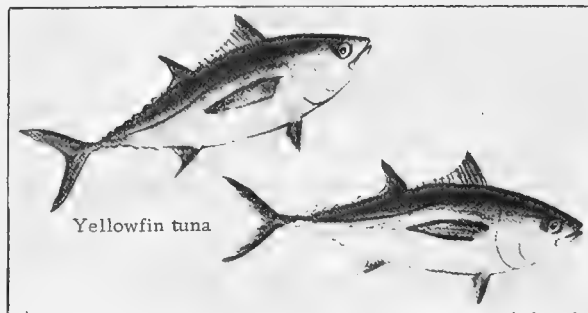
Tuna including skipjack and shark, are abundant around New Caledonia. The coastal fisheries in the area are promising for lobster, shrimp, crab, eel, oyster, and sea cucumber, in addition to pearl shells.



Sea cucumber.

As a result of a 30-day exploratory operation by Chiba Prefecture's guidance ship Boso Maru, it was determined that fishing in adjacent waters of New Caledonia is extremely favorable.

A total of 1,189 tuna were caught during a 15-day operation with an average catch of 99 tuna a day in an area designated "A" Area (off Candy Island, Australia). The breakdown



Yellowfin tuna

was 50.7 percent yellowfin, 21.5 percent striped marlin, 6.4 percent albacore and big-eyed. "B" Area (northwest of New Caledonia), for a 4-day operation yielded 113 tuna a day on the average for a total catch of 453 tuna. The breakdown was 63.1 percent albacore, and 18.1 percent yellowfin and black marlin. "C" Area (west of the New Hebrides Islands to New Caledonia) yielded 128 tuna a day on the average for a total of 1,408 tuna during an 11-day operation. The breakdown was 47.9 percent yellowfin, 42.2 percent albacore, black marlin, and others. (Japanese newspaper, December 31, 1962.)

Note: See Commercial Fisheries Review, January 1963 p. 117; August 1962 p. 82; June 1962 p. 62.

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Japan (Contd.):

TUNA FISHING FORECAST FOR EASTERN PACIFIC, JANUARY-FEBRUARY 1963:

The Kanagawa Prefecture Fisheries Experimental Station released its forecast of tuna fishing for January and February 1963 as follows (tonnage indicates long-line catch per 1,800 hooks):

Central Eastern Pacific (20° N. lat.-10° S. lat. east of 150° W. long.): A good fishing period in the sea area 5°-10° N. lat., 110°-130° W. long. A heavier catch is expected in January at the rate of 5.0 metric tons (0.3 ton of yellowfin, 4.5 tons of big-eyed, and 0.2 ton of black marlin). February rate will be less than January at 3.5 tons (consisting of 0.2 ton of yellowfin, 3.2 tons of big-eyed, and 0.1 ton of black marlin).

Also, in the sea area west and east of the sea area, catch will be less at 1.5 tons (0.2 ton of yellowfin, 1.0 ton of big-eyed, and 0.3 ton of black marlin) in the western part. A rate of 2.3 tons (comprised of 0.3 ton of yellowfin, 1.8 ton of big-eyed, and 0.2 ton of black marlin) is expected in the eastern section. Catch and fishing ground will differ between January and February in the sea area from the equator to 10° S. latitude. In January, in the sea area from the Marquesas Islands to 120° W. long. the catch rate will be 4.5 tons (1.1 tons of yellowfin, 3.0 tons of big-eyed, and 0.4 ton of black marlin); in the sea area somewhat south of the area between 100°-120° W. long. the black marlin catch will be less compared with the western area and the catch rate will be 1.2 tons of yellowfin, 3.0 tons of big-eyed, and 0.3 ton of black marlin. In February, in the area from the equator to 7° S. lat., the Marquesas Islands to 120° W. long., big-eyed will be caught; south of the area 7°-10° S. lat., yellowfin, big-eyed, and albacore will be caught. The catch rate is estimated at 3.6 tons (0.9 ton of yellowfin, 2.3 tons of big-eyed, and 0.4 ton of black marlin) for the area of the equator-7° S. lat., 130°-150° W. long. In the area to the east, between 120° and 130° W. long., the catch rate will be 4.5 tons (1.1 ton of yellowfin, 3.0 tons of big-eyed, and 0.4 ton of black marlin).

In the area 7°-10° S. lat., 120°-150° W. long., a catch rate is expected of 4.4 tons (comprised of 1.3 tons of yellowfin, 1.6 tons of big-eyed, and 1.5 tons of albacore). Also, much big-eyed will be hauled in the area between 100°-120° W. long. with a rate of 4.2 tons (0.3 ton of yellowfin, 3.4 tons of big-eyed, 0.3 ton of albacore, and 0.2 ton of black marlin). The catch rate in that area is decreasing year after year and this year it is expected to be about 10 percent less than last year.

Catches of big-eyed and striped marlin are expected around the Galapagos Islands. In January, the catch rate will be 4.5 tons (4.0 tons of big-eyed and 0.5 ton of striped marlin). In February, the rate probably will be 4.7 tons (comprised of 3.3 tons of big-eyed and 1.4 tons of striped marlin).

Southeastern Pacific (south of 10° S. lat., east of 150° W. long.): Catch west of 125° W. long. in January will be at the rate of 4.0 tons (2.2 tons of big-eyed and 1.8 tons of albacore); in February, a rate is expected of 4.0 tons (1.1 tons of yellowfin, 1.5 tons of big-eyed, 1.1 tons of albacore, and 0.3 ton of black marlin). In the area from 105°-125° W. long. in January the rate will be 3.9 tons (0.5 ton of yellowfin, 2.8 tons of big-eyed, and 0.6 ton of albacore); in February the rate will be 3.7 tons (consisting of 0.6 ton of yellowfin, 2.5 tons of big-eyed, and 0.6 ton of albacore). East of 105° W. long. in January, the catch rate is estimated at 4.5 tons (1.8 tons of big-eyed and 2.7 tons of striped marlin) and in February the rate will be 5.0 tons (1.0 ton of big-eyed, 4.0 tons of striped marlin).

Although the sea area south of 13° S. lat. is a fishing ground for albacore and black marlin, the heavier the catch of albacore, the closer fishing will be to the Tahiti Islands with a catch rate of 3.8 tons, (2.6 tons of albacore and 1.2

ton of black marlin. Around 125° W. long. in January and in February, the catch rate is estimated 3.5 tons (comprised of 0.5 ton of yellowfin, 0.2 ton of big-eyed, 2.2 tons of albacore, and 0.6 ton of black marlin). Around the Tahiti Islands in January, the catch rate of 3.8 tons will consist of 0.5 ton of yellowfin, 1.1 ton of albacore, and 2.2 tons of black marlin; and in February, a catch rate of 3.3 tons will be 1.8 tons of albacore and 1.5 tons of black marlin. (Japanese periodical, December 27, 1962.)

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YAIZU FISHERY LANDINGS, JANUARY-NOVEMBER 1962:

At Yaizu (leading tuna fishing port) in November 1962, a total of 8,441 metric tons of fish was landed, valued at \$2,621,250. Landings in November 1962 were down 5 percent from the previous year, but because of higher ex-vessel prices, the value of the landings was up 24 percent. Included in the November 1962 landings were 5,000 tons of tuna.

Landings at Yaizu for January-November 1962 of 123,922 tons were valued at \$33.3 million ex-vessel as compared to 117,121 tons valued at \$29.5 million for the same period in 1961. (Suisan Keizai Shimbun, December 29, 1962.)

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FISH MEAL OPERATIONS:

Japanese fish meal factoryship operations in the eastern Bering Sea are expected to be reorganized drastically in 1963. The Japanese fishing company, which pioneered the development of that fishery, plans to terminate its meal operations in the Bering Sea and will withdraw its two meal factoryships (Kinryo Maru, 9,373 gross tons; Renshin Maru, 14,094 gross tons) from that fishery. The large fishing company that operates the meal factoryship Soyo Maru (11,192 gross tons) and the meal-oil factoryship Tenyo Maru (11,581 gross tons) and still another firm that operates the meal factoryship Gyokuei Maru (10,357 gross tons) are reported to be planning on curtailing their meal operations and concentrating on frozen fish production.

Reportedly, the decline in bottomfish resources in the eastern Bering Sea and competition from low-priced Peruvian meal have made meal operations in the eastern Bering Sea unprofitable.

The first of the three firms referred to above is said to have suffered large losses in 1962 from its Bering Sea meal operation. The firm that owns the Gyokuei Maru re-

Japan (Contd.):

portedly will assume the first firm's liability, totaling close to 3 billion yen (US\$8.3 million), and take over the management.

Under the reorganization, there are plans to expand the Renshin Maru's production of frozen fish off Angola and on continuing the mothership-type king crab operations in the eastern Bering Sea and the Okhotsk Sea. As for the Kinyo Maru, the firm that has taken it over plans to work out an agreement with a South American meal-producing nation whereby fishing vessels of that country would deliver their catches to the Kinyo Maru, which would be anchored offshore, for processing into fish meal. (Suisan Tsushin, January 12 & 17; Suisan Keizai Shimbun, January 13, Shin Suisan Shimbun, January 14, 1963.)

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FISH MEAL IMPORTS:

The Japanese Government early in January 1963 approved the importation of 20,000 metric tons of Peruvian fish meal at a c.i.f. price of \$136 per ton. This represents a price increase of \$10 per ton since December 1962. (Shin Suisan Shimbun Sokuho, January 17, 1963.)

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FISHERIES AGENCY'S 1963 BUDGET:

The Japanese Government has prepared budget estimates for fiscal year 1963 (April 1963-March 1964), which were presented to the Diet (Parliament) when it reconvened in late January. Budget estimates for the Fisheries Agency, Ministry of Agriculture and Forestry, total ¥17,064 million (US\$47.4 million), an increase of nearly ¥1.9 billion (\$5.3 million), or 12.5 percent, over the previous year's regular fishery budget of ¥15,166 million (\$42.1 million).

For the program on "biological research related to international fisheries," the Fisheries Agency is requesting an increase of 44.5 million yen (\$124,000). This increase is to be used primarily for carrying out an extensive tuna research program involving the use of about 50 prefectural research and training vessels, with emphasis to be placed on the investigation of tuna resources, rather than on the development of new tuna fishing grounds. (Nihon Suisan Shimbun, January 11, 1963.)

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BUDGET FOR PROMOTION OF AGRICULTURAL AND MARINE PRODUCTS EXPORTS IN 1963:

Following conferences with the Ministry of Finance, the Japanese Ministry of Agriculture and Forestry announced on January 9, 1963, that a budget of 148,680,000 yen (US\$413,000) has been approved for the promotion of exports of agricultural and marine products for fiscal year 1963 (April 1963-March 1964). The export promotion program will be administered by the Japan Export Trade Promotion Agency (JETRO), a quasi-governmental body.

JETRO's proposed program for FY 1963 includes stationing, for the first time, an agent at San Francisco, whose responsibility will be to analyze market trends of agricultural and marine products in the western United States, primarily in California. The Japanese Government is contributing 75 percent of the cost (2,220,000 yen or \$6,167). As for other areas, like New York City, Hamburg (Germany), and Hong Kong, JETRO plans to continue to maintain personnel in those areas.

JETRO plans to continue surveys on products like canned tuna and canned saury, as in past years. Concrete plans for conducting those surveys are to be drafted by April 1963, following consultations with industry. A budget of 15,875,000 yen (\$44,100) is being allotted for all market surveys, with the Government contributing the full sum.

In the field of promotion, JETRO plans to conduct an advertising campaign in France to promote the sale of pearls. This is a new program, and the Government is contributing half of the cost, or 5 million yen (\$13,890). A similar amount is being contributed by the Government for sales promotion in England.

Promotion of marine products, like canned tuna and frozen tuna, is to be continued, with concrete plans to be formulated by April 1963. (Suisan Keizai Shimbun, January 10, 1963.)

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SARDINE CANNING TRENDS, JANUARY 1963:

Sardine canners in the Sanin area of Japan on the Japan Sea early in January 1963 were reported to have begun buying sardines being landed in the Sanriku area at \$30-\$38 per ton ex-vessel. As of early January, canned sar-

Japan (Contd.):

dines packed in the Sanriku area were equally divided between domestic use and export. Almost all the export pack (mostly No. 1 cans in tomato sauce) was of high quality and good enough to pass export inspection for the United States.

Exporters were of the opinion that exports of canned sardines would be resumed in January, and an estimated 100,000 cases were expected to be exported.

Sardine packing along the Sanriku coast was progressing smoothly toward the end of 1962 and some 30,000 cases packed for export had been consigned to the joint sales company according to a January 10 report. Almost 20,000 cases had passed inspection for export to the United States. (Suisan Tsushin of January 4 and 10, 1963.)

TRAWLER FISHING IN NORTHWEST ATLANTIC LANDS FIRST TRIP AT ST. PIERRE:

The Japanese stern-trawler Aoi Maru No. 2, which left Nagasaki in August 1962 and began fishing off Newfoundland about mid-October, landed its first trip of frozen fish either late in December last year or early January this year at St. Pierre for transshipment to the United States. The catch, consisting of about 657,000 pounds of round and dressed fish, arrived in Gloucester, Mass., on January 15, 1963 (see table).

Japanese Stern-Trawler Catch from Northwest Atlantic Grounds Landed at St. Pierre and Transshipped Frozen to Gloucester, Mass.

Species	Net Weight
	Pounds
Cod	34,452
Haddock	127,952
Flounder	274,296
Sole	41,360
Hake	128,586
Halibut	4,268
Ocean perch	15,796
Pollock	3,575
Lobster	572
Shrimp	88
Miscellaneous	26,098
Total (14,871 pkgs.)	657,043

Note: Fish were frozen in so-called "logs" and wrapped in burlap. The cod, haddock, hake, and pollock were headed and gutted (dressed); most of the remainder was round.

A report by the Japanese periodical, Suisan Tsushin of December 31, 1962, stated that since the vessel arrived on the fishing grounds (Grand Banks) the catch of cod was

not up to expectations. However, according to the periodical, the vessel was expected to have a full load by the end of 1962.

The same source reports that with better weather conditions the vessel expects to survey a wide area east and north of Newfoundland. The Japanese sponsors of the expedition feel that another trawler is needed to cover the wide area to be investigated and will probably request permission to send another vessel to aid the Aoi Maru No. 2 to investigate the bottomfishing potential in the Northwest Atlantic.

BOTTOMFISH MOTHERSHIP ASSOCIATION FISHING PLANS IN NORTH PACIFIC FOR 1963:

The Japanese Northern Waters Bottomfish Mothership Association, composed of the 16 companies operating bottomfish fishing fleets in the Bering Sea, North Pacific Ocean, and the Okhotsk Sea, met on December 17, 1962, in Tokyo, to discuss 1963 bottomfish operations. At the meeting, the Association agreed to restrict its 1963 operations to a total of 25 motherships and 346 catcher vessels, and submitted a final proposal to that effect to the Fisheries Agency. The proposal represents an increase of 52 catcher vessels over actual 1962 operations, when 294 catcher vessels were employed, according to the Japanese periodical Suisan Keizai Shimbun, December 18, 1962.

BERING SEA BOTTOMFISH LANDINGS, 1961-62:

The bottomfish landings (including shrimp but exclusive of king crab) of Japanese mothership fleets operating in the Bering Sea in 1962 were down about 20 percent from the

Japanese Bering Sea Bottomfish Landings, 1961-62^{1/}

Species	1/1962	1961
	..... (Metric Tons)	
Flatfish	346,553	453,963
Halibut	9,942	11,005
Cod	9,642	6,764
Alaska pollock	59,455	24,404
Silver cod (sablefish)	28,340	26,231
Rockfish ^{2/}	12,618	10,543
Shrimp	16,797	10,255
Herring	9,942	72,260
Miscellaneous	3,655	5,719
Total	496,944	621,114

^{1/}Preliminary.

^{2/}Statistics from various Japanese sources vary as to the landings of rockfish in 1962.

Japan (Contd.):



A Japanese trawler fishing bottomfish for the mothership in the Bering Sea.

previous year. The decline was due mainly to a cutback in the number of mothership fleets operating during that year. The Japanese Fisheries Agency licensed only 23 mothership fleets to fish for bottomfish in the Bering Sea in 1962 as compared to 33 motherships licensed in 1961.

In 1962, there was a sharp decline in the Japanese Bering Sea catch of herring (down 86.2 percent) and flounder (down 24.0 percent). The decline was offset partly by an increase in the catch of Alaska pollock (up 143.6 percent), and shrimp (up 63.8 percent).

Area E was the main fishing ground for the vessels serving the five fish meal factoryships in the Japanese Bering Sea bottomfish fleet. Fish meal production was hampered by the small size of the flatfish caught as well as by the decline in the total flatfish catch. The increase in the catch of Alaska pollock, which was used only for fish meal, did not offset the decline in the flounder catch. The Japanese Bering Sea fish meal factoryships were reported to have lost money in 1962.

Note: See *Commercial Fisheries Review*, February 1963 p. 76; August 1962 pp. 74-76; and June 1962 p. 56.

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FROZEN HALIBUT EXPORTS:

Japanese exports of frozen halibut to the United States as of mid-December 1962 a-

mounted to some 2,000 short tons during the 1962 Japanese fiscal year (began April 1, 1962). Of that amount, 95 percent was steaks. It is estimated that another 700 or 800 metric tons (almost all dressed) were exported to Great Britain. Exports to Britain in 1962 were more than five times as much as the previous year. Exports to the United States in 1962 were twice as much as in 1961.

Export c.i.f. prices to the United States for steaks were a maximum of 48.5¢ a pound and averaged 40¢ a pound--7-10¢ higher than the previous year. Prices for dressed halibut to Britain were 2 shillings 2-3 pence (30-31 U. S. cents) a pound c. & f.--2-3 pence (2-3 cents) higher than the previous year.

Some 500 tons are reported in stock in Japan, but purchases are expected for the Lenten season. Export demand for frozen halibut was sluggish in December 1962.

The price of broadbill swordfish started to drop in November 1962 and towards the end of December was 1¢-2¢ per pound cheaper on the average. Inasmuch as it is reported that broadbill swordfish long-line fishing in waters off the east coast of the United States is being developed, many in Japan are inclined to feel that it will take some time for the market to recover. (*Suisan Tsushin*, December 26, 1962.)

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Japan (Contd.):

PEARL ESSENCE IMPORT DUTY REDUCED:

The Japanese import duty on pearl essence (Tariff item 3209-2) will be reduced from 10 to 8 percent ad valorem as a result of the United States-Japanese compensatory trade agreement announced December 31, 1962.

In the agreement, Japan granted tariff concessions to the United States in compensation for the modification by Japan of a number of concessions previously made under the General Agreement on Tariffs and Trade (GATT).

During 1961, Japan imported pearl essence valued at \$606,000 from the United States.

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TRAWLING OPERATIONS IN DISTANT WATERS:

As of early 1963, Japan had 27 large trawlers (12 belonging to one firm and 10 to another) operating off the west coast of Africa, north of Australia, and the Northwest Atlantic. By the end of 1963, the Taiyo Maru No. 3 (1,500 gross tons) will be completed and join others in the Atlantic. In addition, four new large trawlers of the 2,800- to 3,500-ton class are planned to be built beginning in 1964.) Besides a trawler of the 2,500-ton class to be completed in August 1963, the same firm has revealed its plan to build two more of the same type.

The competition among Japanese trawlers is becoming evident at operational bases in Ghana, Spain, Italy, Greece, Las Palmas, and Capetown. There are signs of decreasing catches per vessel.

There is a move to dissolve the current "Sansuikai" organization comprising seven overseas trawling companies and in its place organize an adjustment organization of the industry similar to the Northern Sea Mother-ship Council (organization of owners of salmon-trout motherhips of northern seas). Establishment of such an organization by the end of 1963 is the goal. The plan is to assimilate organizations in the industry having legal backing to adjust export prices and destinations, catch, regulation of fishing grounds, study and research in resources, and others. (Japanese newspaper, January 4, 1963.)

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TRAWLER TO EXPLORE WATERS SOUTH OF ALASKA PENINSULA:

Japan announced at the Ninth Annual Meeting of the International North Pacific Fisheries Commission (INPFC) held in Seattle in November 1962 its intention of sending one integrated trawler during the 1962/63 winter to explore the waters south of the Alaska Peninsula. The January 13, 1963, issue of the Japanese periodical Suisan Keizai Shimbun reported that Japan planned to dispatch the 1,454-ton stern trawler Akebono Maru No. 51. The vessel was scheduled to depart from Hakodate, Hokkaido, on January 18 for the Gulf of Alaska, where it will conduct trial fishing for shrimp, redfish, cod, and sablefish. Its production target is 744 metric tons of bottomfish. The trawler is scheduled to return to Kurihama, Kanagawa Prefecture, on April 12.

Under the proposal of intentions submitted by the Japanese National Section at the 1962 INPFC Meeting, the Akebono Maru is expected to avoid areas of concentration of halibut, return to the sea any halibut caught incidental to its operations, avoid fixed gears (such as king crab pots or halibut long lines) fished by Canadian or United States fishermen, and to submit a record of its operations to the INPFC.

According to an announcement made by the Japanese Fisheries Agency, a U. S. Bureau of Commercial Fisheries fishery research biologist will board the vessel before its departure from Japan as an observer for the United States. (Suisan Keizai Shimbun, January 13, 1963.)

The Akebono Maru reportedly will operate in the North Pacific Ocean north of 50° N. latitude and east of 170° W. longitude, according to the following cruise plan.

Date	Area of Operation	Position (Longitude W.)	Species to be Explored
Feb. 6-11 . . .	So. of Unimak Is.	164°-165°	Redfish
Feb. 12-20 . .	W. of Shumagin Is.	159°-161°	Shrimp
Feb. 23-Mar. 5	Off Kodiak Is.	152°-155°	Cod
Mar. 6-11 . . .	No. of Portlock Bank	149°	Redfish
Mar. 12-17 . .	SW of Yakutat Bay	141°-142°	Sablefish & Redfish
Mar. 18-21 . .	Off Kodiak Is.	152°-155°	Cod
Mar. 24-Apr. 2	W. of Shumagin Is.	159°-161°	Shrimp

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LARGE STERN TRAWLER BEING BUILT:

A Japanese fishing firm plans to construct a 3,000-ton stern trawler in 1963. The trawler is to be built at a total cost of ¥700 million (US\$1.9 million), with construction to be started in the spring. Target date for completion is mid-September. (Suisan Keizai Shimbun, December 22, 1962; Nihon Keizai Shimbun, January 15, 1963.)



Kuwait

FISHERIES SURVEY BY FAO EXPERT:

The Food and Agriculture Organization (FAO) has assigned an FAO fisheries consultant to the Government of Kuwait for three months. In January 1963, the FAO expert arrived in Kuwait to survey the fisheries in the area and to make recommendations for

Kuwait (Contd.):

their development. He carried out similar assignments as an FAO expert in 1962 in Mauritania and in Nyasaland. (Food and Agriculture Organization of the United States, Rome, January 25, 1963.)



Norway

FISHERMEN STRIKE FOR HIGHER SUBSIDIES:

A fisherman's strike for higher Government subsidies in 1963 began throughout Norway on January 1, this year. The strike as of the second week in January had little effect on consumer supplies, since retail stocks of fresh and frozen fish were high and January is an off-month for fishing. However, some fish-processing plants had begun to lay off workers and the Government feared that a prolonged strike could cause considerable unemployment in Northern Norway, with public works or other stop-gap local employment largely ruled out by the severe winter.

The conflict arose when the fishermen's organization (Norges Fiskarlag) demanded a 20-percent increase in income for 1963, estimated to require a total of 245 million kroner (US\$35.5 million) in Government subsidies on prices or equipment costs. The Government countered with a demand to defer negotiations until the spring, when they could be coordinated with the general round of wage and price negotiations in industry and agriculture; but the fishermen would agree only on condition that they be granted an immediate "transitional" increase of 10 percent (to 190 million kroner or US\$26.6 million). The Government rejected this demand, announcing that pending the spring negotiations the subsidies would be continued at the 1962 level of 99 million kroner (US\$13.8 million). Negotiations were reopened early in January, and there was hope of a compromise settlement before mid-January. (United States Embassy, Oslo, January 8, 1963.)

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FISHERMEN'S STRIKE SETTLED:

The Norwegian fishermen's 9-day strike ended January 9, 1963, when negotiators reached an agreement. Fishing was quickly resumed because the fishermen's organization (Norges Fiskarlag) notified its 28,000

members to go back to work immediately. The settlement was subsequently approved by Government officials and the national committee of Norges Fiskarlag.

The settlement involved a transitional arrangement. Previous provisions for state subsidy to the fishing industry were to be prolonged for several months, with certain supplementary benefits added. Negotiations on a new subsidy agreement will be resumed in the spring of 1963. The Government will then consider a settlement with Norges Fiskarlag in conjunction with the other major settlements due to be negotiated in coming months. These will be conducted between trade unions and industry, and between the state and agricultural organizations. At issue are new price and subsidy arrangements for farmers and new management-labor contracts. (News of Norway, January 17, 1963.)



Okinawa

IMPORT LICENSES EAGERLY SOUGHT FOR JAPANESE TUNA VESSELS:

Since the recent notice by the Japanese Government permitting Okinawa to import tuna vessels amounting to 2,250 gross tons, orders for Japanese fishing vessels have poured in from Okinawan fishing companies. As soon as import licenses are issued by the Okinawan Government, orders for the entire tonnage are expected to be placed.

The vessels allocated to Okinawa are secondhand ones without Japanese tuna fishing rights, and talks between buyers and dealers are based on 700-, 500-, and 300-ton class vessels. Vessels of those tonnage classes have been used by the Japanese for tuna fishing in the Atlantic.

Okinawa may export frozen tuna to the United States and Europe. It is likely that Japanese exporters will handle the exports directly or indirectly and the market for Japan's frozen tuna exports may be affected. (Suisan Tsushin, December 31, 1962.)



Pakistan

SHRIMP TRAWLER FLEET EXPANDED:

A new addition to Pakistan's shrimp fishing fleet is the factory mothership Mahia which was scheduled to be handed over to her

Pakistan (Contd.):

owners some time early in 1963. Also, a number of small stern trawler-type shrimp fishing vessels were recently built for the Pakistan fishery, the latest from an Aberdeen, Scotland, shipyard. These were built primarily for fishing the west coast of Pakistan and adjacent areas in the Indian Ocean which have been found to be productive, and very favorable for shrimp-trawling operations. The impetus in building a new shrimp fishing fleet in Pakistan is largely attributed to the popularity and increasing demand for shrimp in the United States. Pakistan's shrimp exports to the United States during January-November 1962 were 2.7 million pounds, more than double the 1.3 million pounds exported in the same 11 months of 1961.

The *Mahia* is 1,220 gross tons and was formerly the *Sapele*, a cargo vessel operated by the Elder-Dempster Lines. She was delivered to a Norwegian shipyard during the summer of 1962 for conversion into a shrimp freezer vessel for a Pakistani firm in Karachi. Conversion of the vessel, as well as repairs, were in accordance with Lloyd's 100 A.1. class, and met the specifications and requirements of the Pakistan Government's Ministry of Communications (Directorate General of Ports and Shipping).

The vessel's over-all length is 224'5", has a length of 210' between perpendiculars, moulded breadth of 36'6", and a depth of 21'8" to upper deck. Her main engine is a 3-cylinder, triple-expansion steam engine manufactured in 1938. A new engine-room was constructed in the vessel for the installation of the increased number of auxiliaries needed for the various factory machines installed for handling and processing the catch. It has 2 auxiliary steam engines with 15 kVA generators, and also 2 auxiliary Diesel engines developing 150 b. hp. each at 1,250 r.p.m., and each directly coupled to a 110 kVA alternator of 220 volts d.c.

The refrigerating equipment in the *Mahia* is operated by 3 compressors. Two are driven by electrical motors, the third being directly driven by a steam turbine. Although the refrigerating plant is operated normally by thermostatic refrigerant control, arrangements are provided so that the thermostatic controls may be bypassed and the plant operated by manual controls. Plate freezers with a capacity for 12 tons of shrimp per 24 hours are mounted on the main deck.

Automatic shrimp-processing machinery manufactured by a New Orleans, La., firm installed in the vessel consists of the following: 1 automatic shrimp peeler; 1 automatic shrimp-cleaning machine; 1 automatic shrimp-waste separator; 1 capacity-automatic shrimp deveiner; and 1 fast precision high-capacity grader for raw peeled shrimp.

The vessel's 2 cargo holds are both kept at a temperature of -20° C. (-4° F.) and have a total capacity of 28,510 cubic feet. Another 2 storerooms have a total capacity of 1,446 cubic feet, and a refrigerated storeroom aft has a capacity of 300 cubic feet.

The *Mahia* will be operating with a fleet of shrimp trawlers and after taking on board the trawlers' shrimp catches, a feed tank is used to cool the shrimp to a temperature of approximately 32° F. From the feed tank the shrimp are conveyed into the automatic shrimp peeler which is located atop the new deckhouse, and then through the cleaning machine also located on the new deckhouse. From there, they move down through the shrimp-waste separator to the automatic deveiner on the upper deck. From those machines the shrimp pass through the high-capacity grader on the tweendeck. After being packed by factory workers on the vessel the shrimp will be frozen in the freezing machines, packed in cartons, and loaded into the cold-storage holds.

In order to accommodate the extra staff required for the factoryship workers, two new cabins have been built 'tweendecks aft of the factory working space, and a new deckhouse has been added between the midship and aft areas of the vessel. (Submitted by P. Brady, Fleetwood, Lancashire, England.)



Peru

ANCHOVY VESSELS AND CATCH, 1961:

A large part of Peru's great anchoveta catch is taken in small wooden vessels. The vessels known as "anchoveteras" average 65 feet in length and have a capacity of about 120 metric tons. The average "anchovetera" re-



Fig. 1 - Peruvian "anchovetera" with hold and decks full of fish unloading at Chimbote.



Fig. 2 - A typical Peruvian "anchovetera."



Fig. 3 - Conveyor belt carrying anchovies into fish meal plant for processing.

Peru (Contd.):

quires a 200-horsepower motor. The vessels are also called "bolicheras" because they use a purse-seine net known as the "boliche." The vessels usually make one-day trips and fish during daylight hours. Some fish meal plants use suction hoses to unload fish from the vessels.

In 1961, Peru's anchoveta catch amounted to 5 million metric tons or about 96 percent of the total Peruvian fish catch. The increase in Peruvian fish meal production indicates that Peru's anchoveta catch was even larger in 1962. Anchoveta is the raw material for Peru's fish meal industry. (United States Embassy, Lima, January 23, 1963.)



Philippine Republic

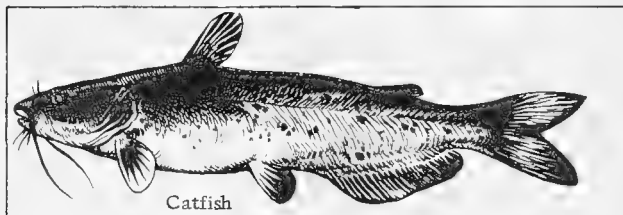
FISHERIES OF BIGGEST LAKE BEING STUDIED:

Laguna de Bay is the biggest lake in the Philippine Islands. It is about 355 square miles and is well known locally for its fishery resources, as well as ducks. Laguna de Bay has been fished for generations, but the extent of its potential and that of other lakes in the Philippines is relatively unknown. The shores of the lake are thick with water hyacinth, a pest plant which spreads like a miniature jungle and also grows in clumps in the bays. One of the problems faced by the local fishermen and scientists in assessing the fishery resources of the lake is control of the water hyacinth if fishing in Laguna de Bay is to continue.

The rapidly growing population of the Philippine Islands is now estimated at 30 million compared with about 20 million ten years ago. The result is a constantly increasing demand for more food, especially protein-rich food such as fish. The Government is planning substantial increases in the national food supply, particularly in rice and fish, and has introduced scientific methods to the local fishery. Laboratories, store-rooms, lecture rooms, and other facilities have been built at Los Banos near Laguna de Bay to house the staff of the Freshwater Fisheries Investigation Unit which has been formed by the Philippine Bureau of Fisheries. The Unit consists of two sections, one for biology and the other for aquatic resources.

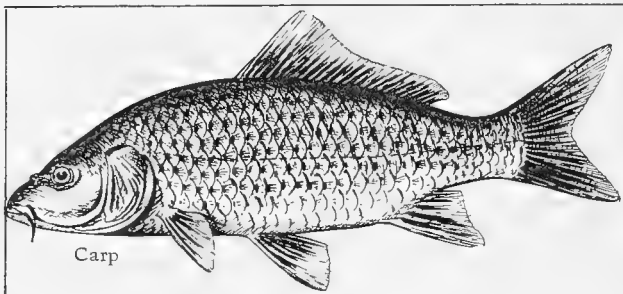
Assistance in setting up the Philippine Freshwater Fisheries Investigation Unit was given by the Food and Agriculture Organization (FAO) which sent a fresh-water fisheries biologist to assist the local staff. Another FAO fisheries expert was scheduled to go to Los Banos early in 1963 to continue the work of assisting the local Philippine scientists in their investigations. Most of the scientific equipment used was provided by Great Britain under the Colombo Plan, and fishing gear and other equipment used in the scientific studies were donated by FAO.

According to a member of the Unit's scientific staff, their objective is to determine the fish population of Laguna de Bay to see how much fishing can be carried on to obtain maximum yield without impairing the fish stocks. The investigation being conducted by the Unit is extensive. It covers chemistry, hydrography, plankton studies, the life history of the lake fish and shrimp, fish taxonomy, and fish populations. The lake has been divided into four areas to carry out such investigations and research. The lake has a wide variety of fish including catfish, carp, mullet,



Catfish

goby, perch, and other species. Fresh-water shrimp in commercial quantities is also caught in the lake.



Carp

One of the scientists on the Freshwater Fisheries Investigation Unit staff spent a year in Great Britain on a Colombo Plan scholarship. At the Los Banos Laboratory, he is studying non-biting midges (small winged insects which breed in water). Fish feed on the larvae of the insects. The scientists hoped to cultivate the insect larvae in

Philippine Republic (Contd.):

ponds, to use with algae as a food for fry and fingerlings raised in fish farming. (Food and Agriculture Organization, Rome, January 20, 1963.)



Portugal

CANNED FISH EXPORTS,
JANUARY-SEPTEMBER 1962:

Portugal's total exports of canned fish during the first nine months of 1962 were about unchanged from the same period of 1961. Sardines accounted for 78.7 percent of the 1962 exports of canned fish, followed by anchovy fillets with 8.5 percent.

Portugal's principal canned fish buyers in the first nine months of 1962 were Germany with 9,999 metric tons, followed by the United Kingdom with 7,799 tons, the United States with 5,870 tons, Italy with 5,714 tons, and France with 3,729 tons.

Portuguese Canned Fish Exports, January-September 1961-1962

Product	January-September			
	1962		1961	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	39,305	2,067	40,281	2,120
Chinchards	1,626	85	1,733	91
Mackerel	1,722	69	1,060	42
Tuna and tuna-like	2,833	94	2,689	96
Anchovy fillets	4,253	425	3,770	377
Others	214	11	186	10
Total	49,953	2,751	49,719	2,736

In September 1962, Portugal's canned fish exports to the United States consisted of 378 tons of sardines, 157 tons of tuna, 218 tons of anchovy fillets, 8 tons of mackerel, and 9 tons of other species. (Conservas de Peixe, November 1962.)

CANNED FISH PACK,
JANUARY-SEPTEMBER 1962:

Portugal's total pack of canned fish in oil or sauce for the first nine months of 1962 was 15.1 percent greater than in the same period of 1961. The sardine pack accounted for 63.4 percent of the total pack, followed by mackerel with 12.0 percent, tuna 10 percent, and anchovy fillets 8.1 percent of the January-September 1962 total. The canned

sardine pack for the first nine months of 1962 was up about 4.1 percent as compared with the same period in 1961. Packs of all other canned fish products also increased in January-September 1962 as compared with the same period of 1961.

Portuguese Canned Fish Pack, January-September 1961-1962				
Product	January-September			
	1962		1961	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	30,781	1,620	29,651	1,561
Chinchards	2,724	143	1,987	104
Mackerel	5,838	233	2,766	110
Tuna and tuna-like	4,856	162	3,957	140
Anchovy fillets	3,938	394	3,638	364
Others	433	23	211	11
Total	48,570	2,575	42,210	2,290

During January-September 1962 sardine landings amounted to 69,385 metric tons, up fractionally from sardine landings of 69,164 tons in the same period of 1961. (Conservas de Peixe, November 1962.)

MORE BONDS ISSUED TO
AID FISHING INDUSTRY:

The sixth series of bonds, issued for the benefit of the fishing industry, has been authorized by the Portuguese Ministry of Finance and Navy. The bonds, amounting to 24 million escudos (about US\$840,000), will be used under the Second Six Year Development Plan for the construction and modernization of trawlers, the completion and equipping of the new fishermen's wharf near Lisbon, and the construction and conversion of cod fishing vessels.

Although fish is a major item in the Portuguese diet, the fishing fleet is below modern standards. The cod fishing fleet, that operates in the western Atlantic for about seven months each year has failed to supply the need for salt cod. In 1961, Portugal imported close to US\$8 million worth of salt cod from other countries. (United States Embassy, Lisbon, December 21, 1962.)



Spain

NEW FISHERY FIRM PLANS
LARGE-SCALE EXPANSION:

The six freezer-trawlers of a new Spanish fishery firm landed 4,500 metric tons of fro-

Spain (Contd.):

zen hake in 1962. The trawlers fished off the coast of South Africa and South America (mainly off the coast of Argentina). The firm plans to expand its fishing fleet, begin producing fish meal, and raise its production of frozen fish and fish meal to 14,000 tons in 1963 and 25,000 tons in 1964.

Two more vessels will be completed for the new firm by June 1963. The firm plans a fleet of 21 vessels, including two refrigerated transport vessels and a factoryship. The latter is being converted from the former transatlantic liner Havana. It will be renamed Pescanova I and operate as a refrigerated transport vessel, as well as a factory for processing fish and producing fish meal. It has a registered tonnage of 16,213 and a cargo capacity of about 7,000 tons. Pescanova I will be Spain's first factoryship.

The new firm is also exploring new fishing grounds. This is apparently the first mission of each new vessel added to its fleet. The firm is the only Spanish firm known to be operating outside the traditional fishing grounds worked by the Spanish fishing fleet. For the time being, the firm is only interested in hake, but other species are being considered for future exploitation. Working under an ambitious plan, the firm has not hesitated to attempt the introduction of frozen fish in the Spanish market. While this innovation had only lukewarm reception at first, it is gaining greater acceptance among the consuming public in inland areas, where the supply of fresh iced fish is uncertain. (United States Consulate, Vigo, January 18, 1963.)

Note: See Commercial Fisheries Review, June 1962, 1. 61.



Thailand

INDUSTRIAL PROMOTION ACT OF 1962 INCLUDES BENEFITS FOR THE FISHING INDUSTRY:

The Promotion of Industrial Investment Act of Thailand, a revision of previous laws relating to the promotion of industrial investment, including private foreign investment, went into force on February 10, 1962. The new law substantially increased the privileges and benefits awarded to promoted industries. The law provides that promotion certificates may be granted to individuals and

firms that plan to establish or expand certain types of industries in Thailand. The promotion certificates carry specific guarantees, rights, and benefits including tax reduction. The following parts of the fishing industry are eligible for promotion under the new law: fish processing, deep-sea fishing, and pearl oyster breeding. To qualify under the law, a fish processing operation must have a minimum daily capacity of five metric tons. Deep-sea fishing projects are required to include a shore plant with the capacity to process the catch of a vessel of at least 30 gross tons operating in waters of a depth of at least 30 meters (98 feet). Deep-sea fishing applications must cover both shore and offshore operations as a package project. The minimum investment required of a pearl oyster breeding project is \$100,000.

Note: Detailed information about the new law is given in Industrial Promotion Act of Thailand, 1962, WTIS Part 1, Economic Report No. 62-81. Price 15 cents. That report is supplemented by Investment Factors in Thailand, 1962, WTIS Part 1, Economic Report No. 62-82. The reports were issued by the Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., and are sold by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., and by U. S. Department of Commerce field offices.



U.S.S.R.

FISHING FLEET OPERATIONS IN WATERS OFF U. S. COAST, 1962:

Highlights of the Soviet fishing effort off the United States coast in 1962 by areas:

North Pacific and Bering Sea: In this area, a peak of about 200 Soviet fishing vessels was sighted in mid-June 1962, mostly in the Bering Sea. Segments of the fleet began to move into the eastern North Pacific and the Gulf of Alaska in June; over 100 sightings of Soviet vessels were reported in the Gulf of Alaska in late November. In mid-November, 18 Soviet fishing craft were 30 miles south of Cordova, Alaska.

The North Pacific Soviet catch was reported to have included king crab, herring, ocean perch, cod, sablefish, Alaska pollock, and flounder. The quantity of each species taken is not known. No reports have been received of Pacific halibut being taken.

In 1961, over 100,000 metric tons of fish and shellfish were taken by the Soviets in the eastern Bering Sea; the 1962 catch is expected to total several times that of 1961. Soviet plans call for a maximum sustained annual catch of 500,000 metric tons from the eastern Bering Sea. No catch goals have been announced for the Gulf of Alaska. (Unpublished and other Soviet sources.)

Other Areas in the Pacific: In the early summer of 1962, two Soviet exploratory fishing vessels were reported off the coasts of Oregon and Washington; species taken unknown.

Northwest Atlantic (Georges Bank): A peak of about 160 Soviet fishing vessels was sighted on Georges Bank in August 1962. Herring was taken in quantity. Bottomfish such as ocean perch, cod, haddock, flounder, and Atlantic halibut probably were taken in lesser quantities. A Soviet exploratory vessel was reported to have taken menhaden.

U. S. S. R. (Contd.):

In 1961, the Soviet catch in the Northwest Atlantic (including the Grand Banks and Georges Bank) was about 350,000 metric tons of fish, of which about 158,000 tons were cod, 68,000 tons were herring, 60,000 tons were ocean perch, 40,000 tons were haddock, and the remainder a variety of other species. The 1962 catch is reported to have been at least as large if not larger. (Various published and unpublished sources.)

North and South Carolina and Florida Coasts: In late 1962, several Soviet vessels were reported engaging in exploratory fishing off the Carolina coasts and Florida. The species taken are not yet known, but commercial quantities of menhaden, shrimp, and possibly tuna were probably being sought.

Caribbean and Gulf of Mexico: Five Soviet trawlers are believed to be operating in the Caribbean and Gulf of Mexico out of Cuba. In late 1962, three of the vessels docked in Veracruz, Mexico, for supplies. In August 1962, announcement was made of a Soviet-Cuban fishing base to be built in Havana, Cuba. The base is expected to aid Soviet fishing operations throughout the Western Atlantic.

* * * * *

NEW CRAB FACTORYSHIP:

Late in December 1962, the newest Soviet crab canning factoryship, the Aleksander Obukhov, left Leningrad for its home port of Vladivostok. This vessel is reported to be outfitted with equipment superior to that used on canning ships currently operating in the North Pacific and Bering Sea. The canning line has a daily capacity of 200,000 cans of fishery products. (Unpublished sources.)

* * * * *

SOVIET FISHERY RESEARCH EMPHASIZES THE DEVELOPMENT OF FISHING IN THE PACIFIC OCEAN:

Soviet fishery research has been placed under the control of a new State Committee within the U.S.S.R. Council of Ministers. Some of the plans and goals of Soviet fishery research were described in a statement by the Assistant Director of the U.S.S.R. All-Union Scientific Research Institute of Marine Fisheries and Oceanography (VNIRO), which appeared in the Soviet newspaper, Krasnaia Znamia, September 20, 1962. Following is a translation of the statement:

"All the scientific research necessary for the development of the Soviet fishing industry will be conducted more regularly and purposefully now that the scientific establishments of the fishing industry have been transferred to the State Committee. The task of increasing the total catch to 50 million metric centners (about 11 billion pounds) by 1965 has been set by the Communist Party and the

Government. This can be achieved mainly by developing ocean fishing.

"Science is faced with big tasks connected with the study of new fishing areas and new species of fish in the world ocean. The most perfect technique and latest discoveries in radio-electronics, automatics, and computing equipment must be used in research for the maximum mechanization of fishing operations and fish processing.

"The Pacific is one of the world's richest fishing areas. In the northern part of that ocean, catches have greatly increased in the last few years. The (Soviet) fishing industry of the Far East has, therefore, a particularly big chance to obtain larger catches of fish and other marine produce.

"We propose to organize several important research expeditions in the near future. One of them will be devoted to the study of invertebrates and algae. . . . In many countries, including those of Western Europe, invertebrates are more valued than fish. . . . In the U.S.S.R. that branch of fishing is poorly developed as yet and must be advanced.

"The study of sea depths over 400-500 meters (1,312-1,640 feet) is another major task in fishing research. Modern trawl fishing reaches depths of 250-300 meters (820-984 feet). But we know that greater depths--300-1,000 meters (984-3,280 feet)--are very promising. Explorations conducted by the U.S.S.R. and other countries show that great quantities of valuable fish inhabit those depths--for example, some species of ocean perch and turbot. . . . This research will provide additional fishing facilities in old fishing areas.

"A practical step has already been taken in this direction. In the Bering Sea, good catches have been made at a depth of 400-700 meters (1,312-2,296 feet) by a combined expedition of the U.S.S.R. Pacific Research Institute of Marine Fisheries and Oceanography (TINRO) and VNIRO. Trawling tests yielded a regular catch of up to 2.5 metric tons of fish per hour.

"Special attention will be paid to research on ocean fishing, especially for saury, tuna, and some other species. Besides yielding high-quality raw material, ocean fishing is important because of its regularity--differences in the catch are very small in different years.

U. S. S. R. (Contd.):

"Before the end of 1962 we propose making arrangements for a big expedition which will study the schools of whales in the North Pacific and their migration routes from the wintering areas to summer pastures. The area of operations for new (Soviet) whaling fleets arriving in Vladivostok will then be more clearly defined.

"The organization of the State-Committee for the fishing industry involves various measures meant to improve the material and technical facilities of scientific establishments, including those engaged in Pacific ocean research. . . . Several research ships of large displacement are under construction. Some of them will be placed at the disposal of TINRO."

Note: See Commercial Fisheries Review, July 1962 p. 102, April 1962 p. 64.



United Kingdom

FISHERMEN FROM SOUTHWEST ENGLAND SEEK 12-MILE FISHERIES LIMIT:

Soviet fishing pressure has led English fishermen operating off the coast of Devon in southwest England to seek a 12-mile fisheries limit. In December 1962, a fleet of 70 Soviet trawlers was reported to have caused over £5,000 (US\$14,000) damage to nets and gear used by English fishermen from Devon. The Soviet vessels were said to have destroyed hundreds of English lobster pots and crab lines while fishing just outside the three-mile limit. (Fish Trades Gazette, December 22, 1962.)



Venezuela

EXPORTS OF EDIBLE FISHERY PRODUCTS, 1961:

Shipments to the United States accounted for 76.1 percent of the quantity and 81.1 percent of the value of Venezuela's total exports of edible fishery products in 1961. Shrimp was the leading fishery product exported to the United States by Venezuela in 1961.

Venezuelan Exports of Edible Fishery Products, 1961			
Commodity and Destination	Quantity	Value	
	Metric Tons	Bolivares 1,000	US\$ 1,000
Shrimp:			
United States ^{1/}	1,400.0	3,297.7	984.
Aruba and Curacao Islands . .	5.3	14.5	4.3
Total shrimp	1,405.3	3,312.2	988.7
Fresh and Frozen Fish:			
United States	0.6	1.1	0.3
Aruba and Curacao Islands . .	311.5	407.1	121.5
Total fresh & frozen fish . .	312.1	408.2	121.8
Dried, Cured, and Salted Fish:			
United States	1.5	3.0	0.9
Curacao Island	4.0	7.0	2.1
Total dried, cured, and salted fish	5.5	10.0	3.0
Canned Fish:			
United States	851.5	1,377.8	411.3
West Germany	81.8	142.6	42.6
Colombia	48.8	84.2	25.1
Curacao Island	18.4	28.7	8.5
Italy	9.3	11.6	3.4
Puerto Rico	138.0	276.6	82.6
Other	1.8	2.9	0.9
Total canned fish	1,149.6	1,924.4	574.4
Unclassified Edible Fishery Products:			
United States	7.1	10.5	3.1
Aruba and Curacao Islands . .	88.8	113.9	34.0
Italy	1.0	0.8	0.2
Total Unclassified	96.9	125.2	37.3
Grand Total	2,969.4	5,780.0	1,725.2

1/Probably mostly frozen.
Note: Venezuela bolivares 3.35 equals US\$1.00.
Source: Boletín de Comercio Exterior, December 1961.

^{1/}Probably mostly frozen.

Note: Venezuela bolivares 3.35 equals US\$1.00.

Source: Boletín de Comercio Exterior, December 1961.



CORRECTION

In a map on page 83, February 1963 issue, there was an error in geographic location. "Iceland" should have been the identification instead of "Spitsbergen."



FEDERAL ACTIONS



Department of Agriculture

FARMERS HOME ADMINISTRATION

FISH FARMERS AND OYSTER PLANTERS NOW ELIGIBLE FOR CERTAIN LOANS:

Federal Agricultural Credit Regulations have been revised to include operating and emergency loans for fish farmers and emergency loans for oyster planters.

Revisions to Title 6--Agricultural Credit--Code of Federal Regulations were published by the Farmers Home Administration (FHA) in the Federal Register, January 1, 1963. The new regulations affecting fish farmers and oyster planters appear in Parts 331 and 332. The new regulations (signed December 19, 1962) are part of extensive revisions to Subchapter C--Loans Primarily for Production Purposes--Chapter III, Title 6, CFR.

The revised regulations affecting fish farmers are the result of the Food and Agriculture Act of 1962 (P.L. 87-703). The Act in Section 343 provides, "As used in this title (1) the term 'farmers' shall be deemed to include persons who are engaged in or who, with assistance afforded under this title, intend to engage in fish farming, and (2) the term 'farming' shall be deemed to include fish farming." Those affecting oyster planters are the result of P.L. 87-832 which extends to them the same benefits for production disaster loans as provided for farmers and stockmen.



Civil Aeronautics Board

NEED FOR UNIFORM BILL OF LADING FOR AIR CARGO SHIPMENTS STUDIED:

Shippers are invited to submit their views to the Civil Aeronautics Board (C. A. B.) on the need for a uniform bill of lading



for air cargo shipments. The C. A. B. is considering proposing legislation which would require the air carriers to issue such a document. At present, the air carriers are free to set their own terms for handling freight.



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

GRANT APPROVED TO ESTABLISH MARINE RESEARCH CENTER IN OREGON:

A marine sciences research center at Yaquina Bay near Newport, Oreg., will be established as a result of a \$959,590 public facilities grant from the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The grant will enable the Oregon State Board of Education, Corvallis, Oreg., to build a marine research center which will include a causeway and dock facilities for vessels. The Board of Education will lease the facilities to the Oregon State University which will staff and operate the center.

In addition to the Federal funds, the University will furnish \$245,000 to equip the research center for a total project cost of \$1,204,590. The University will also provide about \$650,000 annually for operating expenses from research grants and State funds.

The new research center will provide important and varied economic benefits. A total of 110 new jobs, including professional and technical positions at the center, will be created as a direct result of the work involved in the project. It is also estimated that 210 indirect jobs will be created in allied trades and services directly associated with the center. The training of scientists, engineers, and industrial personnel at the center will aid the development of marine-oriented industries in the West Coast States. In addition, the center's marine life displays are expected to attract many tourists. A similar research center--the Scripps Institute of Oceanography at La Jolla, Calif. -- attracts 250,000 visitors each year.

The Community Facilities Administration of the U. S. Housing and Home Finance Agency investigated the project and made recommendations which led to ARA's approval. The U. S. Bureau of Commercial Fisheries, the Coast and Geodetic Survey, and the Department of the Navy, all reviewed the project and made favorable recommendations.

Yaquina Bay is located in Lincoln County, Oreg., which was designated as eligible to participate in the Area Redevelopment program because of long-term and heavy unemployment. Lincoln County was also declared eligible because of its previous participation in the Rural Areas Development program of the U. S. Department of Agriculture.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

STUDY OF STATE AND LOCAL FOOD LAWS:

A study of state and local food and drug laws and their administration as recommended by the Commissioner of Food and Drugs, was approved on January 18, 1963, by the Secretary of Health, Education, and Welfare. The study was first suggested by the Association of Food and Drug Officials of the United States. It is made possible by a sum of \$300,000 included in the Department's current appropriation for that purpose.

The study was strongly supported by the Citizens Advisory Committee on the Food and Drug Administration, which submitted its report last October. It will be made by a qualified nonprofit organization, such as a foundation or university under a contract with the Department.

"This survey will cover State and local activities with respect to foods, drugs, therapeutic devices, cosmetics, and hazardous substances used in the home," the Secretary said. "It should bring to light any needed improvement in laws, organization, and support for Federal-State coordination. The organization conducting the study will be requested to include in its report specific proposals for bringing about the improvements they recommend."

Note: See Commercial Fisheries Review, December 1962 p. 87.



Department of the Interior

SUPPORTS PROPOSAL TO OPEN EASTERN BERING SEA HALIBUT FISHERY TO JAPANESE FISHERMEN:

The Secretary of the Interior has strongly reaffirmed his belief in the principle of abstention by supporting recent action of the American Section of the International North Pacific Fisheries Commission which would open the eastern Bering Sea to halibut fishing by Japan.

In a letter to Alaska's Governor, the Secretary said the American Section's action merited support because it will protect the vital interests of United States fishermen and

will preserve the integrity of the basic principle of "abstention"--a treaty arrangement under which member countries agree to refrain from catching certain fish in specified areas. (The text of the Secretary's letter is reproduced on p. 88.)

The Secretary's letter pointed out that under the American Section's recommendation only the eastern Bering Sea would be opened to Japanese halibut fishing. Only about 10 percent of the halibut fishery is located in that area. The remaining 90 percent of the fishery, located in the eastern North Pacific Ocean, remains completely protected for United States and Canadian fishermen under the abstention principle.

Under the 1952 North Pacific Treaty, the Secretary explained, Japan agreed temporarily to refrain from fishing for halibut in the Bering Sea. If scientific evidence later showed that the United States and Canada were taking all the halibut the resource could sustain, Japan would continue to abstain from fishing for halibut in Bering Sea waters.

The Secretary in his letter stated that the International Commission simply did not have the necessary scientific evidence to support the conclusion that the halibut fishery in the Bering Sea is now being fully utilized.

If the United States and Canadian Commissioners were to insist upon Japanese abstention from halibut fishing in the Bering Sea--based upon inadequate scientific evidence--the very principle of abstention might be placed in jeopardy, the Secretary said. If that happened it could have grave effects on the United States fishing industry in the future, he added.

"It is our objective to see that the (treaty) situation continues to be favorable to the American fishermen, and we see continuation of the Convention as a means to that end," the Secretary said.

The Secretary noted that at the Commission's February meeting in Tokyo, that the conservation measures for the eastern Bering Sea were to be thoroughly reviewed. "I am hopeful that the resultant agreement will still allow a continued expansion of the United States fishery in this area," the Secretary said.

The halibut catch by United States and Canadian fishermen in the Bering Sea has

increased from some 267,000 pounds in 1956 to more than 7 million pounds in 1962. There is evidence that new concentrations of halibut have been found recently as the fleet has expanded, the Secretary said.

He also noted that the Commissioners were assisted in their discussions on this matter by high-level industry and government representatives in their deliberations on the halibut question.

Dear Governor Egan:

President Kennedy has requested that I supply a further answer to your letter of December 21 in which you support your criticism of recent action on the International North Pacific Fisheries Commission with detailed quotations and facts. I have looked into this matter in some detail. I find the problem both complicated and serious.

It is true that, if the President approves the recommendation which the International North Pacific Fisheries Commission made at its 1962 annual meeting, the Japanese may develop a halibut fishery in competition with our own fishery in the eastern Bering Sea. We have no idea yet of the kind or size of this fishery.

As you know, there will be a meeting of the Commission in Tokyo this coming February, and at that time the conservation measures for the eastern Bering Sea halibut will be thoroughly reviewed. The primary purpose of this meeting will be to develop a conservation program which will assure the maximum productivity of the halibut resources of the eastern Bering Sea in view of the expected entry of the Japanese into this fishery. At the same time I am hopeful that the resultant agreement will still allow a continued expansion of the United States fishery in this area.

On reviewing the action of the North Pacific Commission, I do not find that this decision was arrived at in either a hasty or a haphazard fashion. It is perfectly obvious from the record that the U.S. and Canadian Governments have requested the Halibut Commission over the past 6 or 7 years to prepare for presentation to the International North Pacific Fisheries Commission scientific evidence regarding the extent of the utilization of the halibut stocks of the eastern Bering Sea. It is also evident that there has been close cooperation between scientists of the Halibut Commission and scientists of the Governments of Canada and the United States.

Recently the Halibut Commission prepared a draft report of their investigations in the Bering Sea. This document, which has been studied thoroughly by the scientists of both Governments, has clearly shown the gaps in our knowledge of the eastern Bering Sea halibut resources. This in no way should be taken as critical of the Halibut Commission. With limited funds, they have extended their investigations into the Bering Sea in about the same proportion to the extent of our fishery in that area. This report makes the statement quoted in your letter to the effect that tagging experiments in the Bering Sea have demonstrated a high degree of utilization of halibut found in the area where the U.S. and Canadian fleets concentrate and, further, that some of the Commission's first or preliminary quantitative estimates of fishing mortality give rates higher than those found in other sections of the coast. The report further states: "... although this does not prove that these grounds are being fully utilized, it leaves little doubt that the level of utilization is high. Furthermore, no evidence is even available to suggest that a greater yield could be taken from the region year after year." Unfortunately, these conclusions apply only to the halibut concentrations where fishing up to now has been concentrated. New concentrations have been found recently as the fleet has expanded its area of fishing.

Evidence that the catch in the Bering Sea by the Canadian and United States fishery is increasing is contained in the following table which gives the total Canadian and United States catches in the Bering Sea from 1956 to 1962.

Halibut Catches of the U.S. and Canadian Fisheries Fishing in Bering Sea 1956 through 1962

1956	267,000 lbs.
1957	47,000
1958	2,180,000
1959	4,113,000
1960	5,688,000
1961	3,949,000
1962	7,289,000

It is obvious to me that the Bering Sea halibut stocks have only recently been extensively fished by Canadian and United States fishermen, and the fishery is still expanding. The catch in 1962 was the greatest on record and over 25 times that of 1956.

You have indicated in your letter that because of the statements of the Halibut Commission to the effect that utilization of the concentrations of halibut now being fished is high, and that there seems to be a relationship between the stocks in the Bering Sea and those south and east of the Alaska Peninsula, the action of the International North Pacific Fisheries Commission was beyond understanding. I would refer you to the International North Pacific Fisheries Convention itself.

Article III of this Convention requires that after 5 years the Commission study annually whether or not stocks under abstention continue to qualify under the provisions of Article IV of the Convention.

Article III goes on to state that if the Commission determines that a stock does not reasonably meet the provisions of Article IV, then the Commission shall recommend that it be removed from the Annex. Article IV of the Convention requires that for any stock of fish to qualify for abstention, the Commission must find that: "(1) evidence based upon scientific research indicates that more intensive exploitation of the stock will not provide a substantial increase in yield which can be sustained year after year." As I interpret this section of the Convention, there is no latitude left to the Commission if the United States and Canada cannot show that more intensive fishing will not substantially increase the sustainable yield. The record of the fishery during the past several years has clearly demonstrated that the yield has increased with increased fishing.

There are two other criteria, but in the present instance the United States and Canada, with the help of the Halibut Commission and in spite of its long and serious study of the problem, are unable to provide evidence that more intensive exploitation of the stock will not provide a substantial increase which can be sustained year after year. Thus, if we were to live up to our commitments under the Convention, the only course left, in the face of the record, was to recognize that this proof was not available for Bering Sea halibut and, therefore, that these halibut no longer qualify for abstention. It seems to me that the protection given the North Pacific salmon and halibut fisheries under the present Convention is adequate evidence that this Convention has operated in such a manner as to provide for the conservation of these resources and for the preservation of our own valuable fisheries.

With respect to the Commission's action concerning herring off the west coast of Queen Charlotte Island of British Columbia, the Canadian Section of the Commission again was called upon to prove that these stocks were being fully utilized. Since at the present time, for all practical purposes, there is no Canadian fishery on these particular stocks, it could not be proved. Therefore, again the only action possible that could be taken under the present Convention was to recommend to the signatory governments that these stocks be removed from the abstention list.

It had not occurred to me that the Commission was, in fact, benevolent. On the contrary, it seemed only to be doing what was required. At the same time it must be remembered that, for all practical purposes, the Convention has resulted in almost complete protection of halibut and salmon of the eastern North Pacific Ocean. There remains, of course, the special problem of the sockeye salmon of the Bering Sea. Thus, it appears to me that the results brought about by the present Convention have been very advantageous to American fishermen. It is our objective to see that the situation continues to be favorable to the American fishermen, and we see continuation of the Convention as a means to that end. If the United States is to have it continue, we must abide by its terms. If both you and I do not like some of the terms of the Convention then we should seek to have these altered in various ways more suitable to us. I do not believe, however, that we can criticize the Commission for carrying out the clear mandate which the Convention places on it.

One must remember that this Convention is a very stringent one with respect to the nations involved. On one hand, Japan is prevented from fishing freely on the high seas by virtue of the fact that Japan is obligated to observe abstention with respect to salmon and halibut in the eastern North Pacific Ocean. The Convention limits this severe restriction on the Japanese by imposing demanding scientific criteria on the nations requesting abstention. These limitations are intended to prevent arbitrary and capricious actions which affect the right of nations to fish on the high seas beyond the territorial limits of coastal countries.

After reviewing thoroughly the results of the 1962 meeting and the courses of action open to the Commission under the terms of this treaty, I find nothing irresponsible or haphazard about the action of the Commission. It seems to me that if the United States does not carry out its obligations under the terms of the treaty, the future of our North Pacific fisheries is in jeopardy. As a minimum loss we will share these resources which traditionally have been fished exclusively by Canadian and U.S. fishermen. The resources might well be overfished and depleted by the unregulated fishing of several nations, leaving the halibut stocks in the same pitiable condition they were in before the present Halibut Convention.

I choose to align myself on the side of honoring our international commitment, and protecting the sound principle of abstention. This principle provides for the conservation of the fishery resources of the North Pacific Ocean and allows our fishermen to continue to harvest a major share of these resources on the basis that they have conserved them at great cost and sacrifice and have maintained them at a very high level of productivity for over the past 50 years.

If the U.S. Government fails to accept the recommendations of the Commission, we may very quickly find ourselves with no protection whatsoever for the valuable resources now almost fully reserved for the use of the fishermen of the United States and Canada.

Sincerely yours,

(Sgd) Stewart L. Udall
Secretary of the Interior

Honorable William A. Egan
Governor of Alaska
Juneau, Alaska

Note: See Commercial Fisheries Review, January 1963 p. 64.

FISH AND WILDLIFE SERVICE

ASSISTANT FOR PUBLIC AFFAIRS TO COMMISSIONER'S OFFICE NAMED:



Dwight F. Rettie.

Dwight F. Rettie, of Arlington, Va., has been named Assistant for Public Affairs in the Office of the Commissioner of the Fish and Wildlife Service, the Department of the Interior announced on December 11, 1962.

Rettie, 32, a career service officer, has been public information officer for the Department's

Bureau of Land Management since 1957.

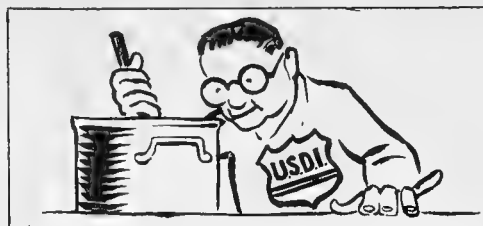
In his new post Rettie will be in charge of the information and education activities for the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. Working on the staff of Fish and Wildlife Service Commissioner Clarence F. Pautzke, Rettie, will direct public information and educational programs covering such diverse functions as oceanography, wetlands preservation, and the growing needs for public services at the Nation's wildlife refuges which last year were host to more than six million people.

* * * * *

BUREAU OF COMMERCIAL FISHERIES

NEW FEES FOR FISHERY PRODUCTS INSPECTION SERVICES:

New fees and charges for fishery products inspection services of the U. S. Department of



Inspection service.

the Interior went into effect on February 1, 1963. The basic change is the increase in the regular hourly rates for continuous inspection from \$4.20 to \$4.45 and for lot inspection from \$6.00 to \$6.50. Other changes include adjustments in fees for score sheets and fees for additional copies of inspection certificates. The cost of maintaining the inspection service for processed fishery products and other products has increased materially since the adjustment of fees which became effective June 1, 1962.

Title 50 of the Code of Federal Regulations is changed by amendments to the regulations governing Part 260--Inspection and Certification of Subchapter G--Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products, relating to fees and charges (50 CFR 260.70 to 260.79). The amended regulations, dated January 14, 1963, appeared in the Federal Register, January 19, 1963, as follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 260—INSPECTION AND CERTIFICATION

Fees and Charges

The regulations governing Part 260—Inspection and Certification, of Subchapter G—Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products, relating to fees and charges (50 CFR 260.70 to 260.79) are hereby amended pursuant to the authority contained in section 6(a) of the Fish and Wildlife Act of 1956 (16 U.S.C. 742e(a)), as amended. The amendment as hereinafter set forth revises the schedule of fees and charges for inspection services.

The cost of maintaining the inspection service for processed fishery products and other products has increased materially since the adjustment of fees which became effective June 1, 1962. The basic change is the increase in the

hourly rates for continuous inspection from \$4.20 to \$4.45 and for lot inspection from \$6.00 to \$6.50.

Other changes include adjustments in fees for score sheets and fees for additional copies of inspection certificates. The amendment is as follows:

1. Section 260.70 is hereby revised to read as follows:

§ 260.70 Schedule of fees.

(a) Unless otherwise provided in a written agreement between the applicant and the Secretary, the fees to be charged and collected for any inspection service performed under the regulations in this part at the request of the United States, or any agency or instrumentality thereof, shall be in accordance with the applicable provisions of §§ 260.70 to 260.79.

(b) Unless otherwise provided in the regulations in this part, the fees to be charged and collected for any inspection service performed under the regulations in this part shall be based on the applicable rates specified in this section for the type of service performed.

(1) Continuous inspection.

Regular time-----	Per hour \$4.45
Overtime-----	5.25

Applicants shall be charged at an hourly rate of \$4.45 per hour for regular time and \$5.25 per hour for overtime in excess of 40 hours per week for services performed by inspectors assigned to plants operating under continuous inspection. Applicants shall be billed monthly at a minimum charge of 8 hours per working day plus overtime, when appropriate, for each inspector. A minimum yearly charge of 260 days will be made for each inspector permanently assigned to each plant.

(2) Lot inspection—officially and unofficially drawn samples.

For lot inspection services performed between the hours of 7:00 a.m. and 5 p.m. of any regular workday—\$6.50 per hour.

For lot inspection services performed between the hours of 5 p.m. and 7 a.m. of any regular workday—\$10.00 per hour.

For lot inspection services performed on Saturday, Sunday, and National legal holidays—\$10.00 per hour.

The minimum fee to be charged and collected for inspection of any lot of product shall be \$4.00.

(c) Fees to be charged and collected for lot inspection services furnished on an hourly basis shall be based on the actual time required to render such service including, but not limited to, the

travel, sampling, and waiting time required of the inspector, or inspectors, in connection therewith, at the rate of \$6.50 per hour for each inspector, except as provided in paragraph (b) (2) of this section.

2. Section 260.71 is hereby revised to read as follows:

§ 260.71 Inspection services performed on a resident basis.

Fees to be charged and collected for any inspection service, other than appeal inspection on a resident basis shall be those provided in § 260.70 and shall include such items as listed in this section as are applicable. The fees to be charged for appeal inspections shall be as provided in § 260.74.

(a) A charge for per diem and travel costs incurred by any inspector whose services are required for relief purposes when the regular inspector is on annual, sick, or military leave: *Provided, That, with regard to military leave, charges for per diem and travel costs incurred by a relief inspector shall not exceed 15 days per calendar year.*

(b) A charge to cover the actual cost to the Bureau of Commercial Fisheries of the travel (including the cost of movement of household goods and dependents), and per diem with respect to each inspector who is transferred (other than for the convenience of the Bureau of Commercial Fisheries), from an official station to the designated plant.

(c) A charge of \$6.50 per hour plus actual costs to the Bureau of Commercial Fisheries for per diem and travel costs incurred in rendering service not specifically covered in this section; such as, but not limited to, initial plant surveys.

3. Section 260.76 is hereby revised to read as follows:

§ 260.76 Charges based on hourly rate not otherwise provided for in this part.

When the appropriate Regional or Area Director determines that any inspection or related service rendered is such that charges based upon the foregoing sections are clearly inapplicable, charges may be based on the time consumed by the inspector in performance of such inspection service at the rate of \$6.50 per hour.

4. Section 260.77 is hereby revised to read as follows:

§ 260.77 Fees for score sheets.

If the applicant for inspection service requests score sheets showing in detail the inspection of each container or sample inspected and listed thereon, such score sheets may be furnished by the inspector in charge of the office of inspection serving the area where the inspection was performed; and such applicant shall be charged at the rate of \$2.75 for each twelve sample units, or fraction thereof, inspected and listed on such score sheets.

5. Section 260.78 is hereby revised to read as follows:

§ 260.78 Fees for additional copies of inspection certificates.

Additional copies of any inspection certificate other than those provided for in § 260.29, may be supplied to any interested party upon payment of a fee of \$2.75 for each set of five (5) or fewer copies.

Notice of proposed rule making, public procedure thereon, and the postponement of the effective date of this revision later than February 1, 1963 (5 U.S.C. 1003), are impracticable, unnecessary and contrary to the public interest in that: (1) The Agricultural Marketing Act of 1946 provides that the fees charged shall, as nearly as possible, cover the cost of the service rendered; (2) the increases set forth herein are necessary to more nearly cover such cost, including but not limited to, increased salaries to Federal employees required by recent legislation; (3) it is imperative that the increase in fees become effective in time to meet such increased costs; (4) users of the inspection service were notified that the rates of fees to be charged for inspection service would be reevaluated as to need for readjustment with each Federal pay act increase by inclusion of § 260.81 into Part 260 Inspection and Certification and published in the FEDERAL REGISTER (27 F.R. 4781); and (5) additional time is not required by users of the inspection service to comply with this revision.

(Sec. 205, 60 Stat. 1090, as amended; 7 U.S.C. 1624)

Dated: January 14, 1963, to become effective at 12:01 a.m., February 1, 1963.

STEWART L. UDALL,
Secretary of the Interior.

JANUARY 14, 1963.



Interstate Commerce Commission

TRUCK DETENTION CHARGES ON TRIAL BASIS IN MIDDLE ATLANTIC AND NEW ENGLAND TERRITORIES APPROVED:

Mandatory truck detention charges by motor carriers operating in the middle Atlantic territory and between that territory and the New England territory were ordered by the Interstate Commerce Commission (I. C. C.)

in a ruling issued December 19, 1962 (Docket No. 33434). Affected motor carriers must establish the prescribed charges on or before March 5, 1963, upon not less than 30 days notice to the general public and the I. C. C. The detention charges will apply when trucks are detained beyond a specified time for loading



and unloading. The charges were approved on a one-year trial basis.

Free time will be allowed for loading and unloading as follows: on shipments less than 24,000 pounds--4 hours; 24,000 to 35,999 pounds--5 hours; 36,000 pounds or more--6 hours. Additional free time ranging from 45 minutes for 5,000 pounds or less to 6 hours for 36,000 pounds or more will be allowed for truckload shipments stopped for completion of loading or partial unloading.

Detention charges for time in excess of free time will be calculated per vehicle on a graduated scale ranging from \$3.70 for 1 hour or less to \$33.10 for 4 hours. An additional charge of \$2.50 will be made for each 15 minutes or fraction thereof over 4 hours.

The ruling on detention charges will apply to vehicles which have been ordered or used to transport shipments subject to truckload rates. Where the tariff requires loading and unloading by the consignor and consignee, the rule applies when vehicles are delayed or detained through no fault of the carrier. Where the carrier is responsible for loading and unloading, the rule applies when vehicles are delayed or detained by the consignor or consignee, not including the time consumed by the carrier in actual loading and unloading. Computations of time are subject to, and are to be made within, the normal business (shipping or receiving) day of the consignor or consignee. When loading or unloading is not completed at the end of such day, time will be resumed at the beginning of the next such day. The rule applies only when a carrier furnishes its power unit(s). Where trailers are spotted for unloading or loading by consignor or consignee and carrier does not furnish power unit(s), the detention charge rule has no application.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

SPECIAL MINIMUM WAGE RATES FOR HANDICAPPED WORKERS IN SEAFOOD PLANTS TO BE CHANGED:

Special minimum wage rates for handicapped workers in seafood plants will be changed by the U.S. Labor Department in three stages--on April 1 and September 1, 1963, and April

1, 1964. Current minimum piece rates and minimum floor wage rates for handicapped workers will continue through March 31, 1963 (rather than January 31, 1963). Existing certificates will continue in effect automatically until March 31, 1963, to permit adequate time for instructions to reach the firms affected and for renewal applications to be submitted.

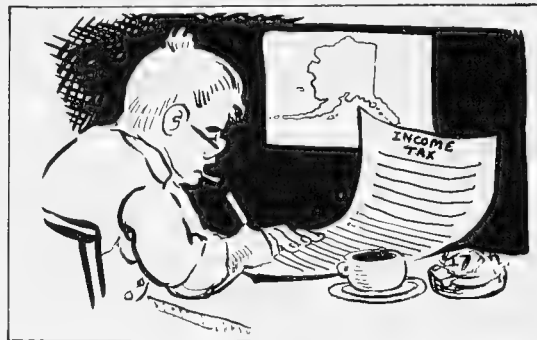


Treasury Department

INTERNAL REVENUE

FISHERMEN'S ESTIMATED INCOME TAX:

Fishermen will now receive the same treatment as farmers with respect to the estimated income tax. This means that, subject to certain rules, fishermen may wait until the end



of the tax year to file and pay their estimated income tax. The change was made by Public Law 87-682 and applies to taxable years which began after December 31, 1962.

An individual, who reports his income on the basis of a calendar year and whose estimated gross income from fishing for the taxable year is at least two-thirds of his total estimated gross income from all sources for the taxable year, now has the privilege of postponing the filing of a declaration of estimated tax from April 15 of the taxable year to January 15 of the following year, at which time the total estimated tax must be paid. His income tax return would then be due on or before April 15 of the year following the taxable year. In the alternative, he may elect to file his income tax return and pay the entire amount of his income tax on or before February 15 of the following year in lieu of filing a declaration of estimated tax.

The law also has provisions which provide comparable treatment for fishermen who file

their income tax returns on the basis of a fiscal year.

* * * * *

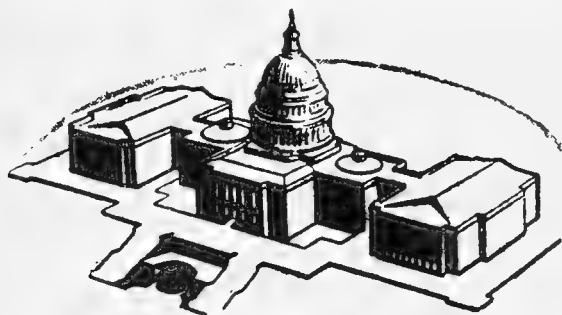
NEW TAX FORMS REQUIRED FROM U.S. STOCKHOLDERS IN FOREIGN FIRMS:

United States taxpayers owning five percent or more of the stock of a foreign corporation will be required--under the Revenue Act of 1962--to file an information return on such holdings before March 31, 1963, the U.S. Treasury Department announced. The stockholder will only have to file such returns once, unless the corporation involved is reorganized, or unless his stock holdings change. This will be the first time a census has been taken of all United States taxpayers who hold a significant share in foreign corporations.



Eighty-Eighth-Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANADROMOUS FISH CONSERVATION: S. 759 (Engle) introduced in Senate Feb. 11, 1963, to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States; referred to the Committee on Commerce. An identical bill H. R. 3779 (Miller) was introduced Feb. 14, 1963; referred to Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES FUND: H. R. 3738 (Rivers) introduced in House Feb. 11, 1963, to promote

State commercial fishery research and development projects, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

COMMODITY PACKAGING AND LABELING: H. R. 3769 (Halpern) and H. R. 3786 (Patman) introduced in House Feb. 14, 1963 to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; referred to the Committee on the Judiciary.

DELAWARE RIVER BASIN: H. Doc. 522, Volumes V and IX, Delaware River Basin, New York, New Jersey, Pennsylvania, and Delaware (A letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated April 2, 1962, submitting a report, together with accompanying papers and illustrations, on a review of the Delaware River and tributaries, requested by a resolution of the Committee on Public Works, U.S. Senate, adopted April 13, 1950, and other resolutions of that Committee and of the Committee on Public Works, House of Representatives, listed in the report, House of Representatives, 88th Congress, 1st Session), 210 pp., illus., printed, and 285 pp., illus., printed, respectively. Volume V contains the report on the comprehensive survey of the water resources of the Delaware River Basin as prepared by the Fish and Wildlife Service, U.S. Department of the Interior for the Corps of Engineers. It presents data regarding the more important fish and wildlife resources of the basin, including related needs and problems, and also describes the probable effects that proposed water development projects will have on various fish and wildlife resources. It also includes a plan suggesting general means whereby fish and wildlife resources can be protected and improved for the enjoyment of present and future human populations of the basin and vicinity. Volume IX contains Appendix P, gross and net water needs; Appendix Q, formation of the plan of development; Appendix R, water control at intermediate upstream levels; and Appendix S, salt water barrier.

ECONOMIC REPORT: H. Doc. 28, Economic Report of the President (Transmitted to the Congress January 1963, together with the Annual Report of the Council of Economic Advisers, 88th Congress, 1st Session), 296 pp., printed. Contains the President's Economic Report to Congress, the 1961-62 Record, the outlook for 1963, tax reduction and reform in 1963, other economic measures, and policies for faster growth. Also contains the annual report of the Council of Economic Advisors to the President.

FISH FARMING LAND TREATMENT UNDER REVENUE CODE: H. R. 3825 (Mills) introduced in the House Feb. 14, 1963, to amend Section 175 of the Internal Revenue Code of 1954 to provide that land used for the production of fish shall be treated as land used in farming; referred to the Committee on Ways and Means.

FOOD-FOR-PEACE, AND FISH: S. 702 (Magnuson et al) introduced in Senate Feb. 5, 1963, relating to domestically produced fishery products; referred to the Committee on Commerce. Provides that any domestically produced fishery product shall be available for the Food-for-Peace Program and distributed as a surplus agricultural commodity under the Agricultural Trade Development and Assistance Act of 1954, as amended, if the Director of the Food-for-Peace Program (or other appropriate official designated by the

President) determines that the utilization of such product will contribute to the success of the Food-for-Peace Program carried out under such act, and if the Secretary of the Interior determines that the utilization of such product will assist in the development of a fishery resource or segment of the fishing industry.

IMPORT COMMODITY LABELING: The House Committee on Ways and Means on February 11, 1963, ordered favorably reported H. R. 2513 (amended) to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes H. Rept. 33. Referred to the Whole House on the State of the Union.

MEDICAL CARE FOR VESSEL PERSONNEL: H. R. 3338 (Pelly) introduced in House Feb. 4, 1963, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel; referred to the Committee on Interstate and Foreign Commerce.

MEDICAL CARE FOR VESSEL OWNERS: H. R. 3873 (Pike) introduced in House Feb. 18, 1963, to amend section 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service; referred to the Committee on Interstate and Foreign Commerce.

NATIONAL SCIENCE FOUNDATION: H. Doc. 39, Twelfth Annual Report of the National Science Foundation Fiscal Year 1962 (Message from the President of the United States Transmitting the Twelfth Annual Report of the National Science Foundation for the Fiscal Year Ended June 30, 1962, House of Representatives, 88th Congress, 1st Session), 385 pp., illus., printed. It is the annual report presented to Congress of the National Science Foundation. Included is the report on the International Indian Ocean Expedition, a scientific project of broad scope and magnitude designed to investigate one of the world's least-explored oceans. The study is under the auspices of the International Council of Scientific Unions and its Committee on Oceanographic Research, now coordinated by the Office of Oceanography of UNESCO. There are four major United States institutions participating in the program which are: Woods Hole Oceanographic Institution, Lamont Geological Observatory, the Narragansett Laboratories of the University of Rhode Island, and the Scripps Institution of Oceanography. The physical oceanography program will include chemical and isotopic analyses of water samples, measurement of current flow at various depths, and geophysical studies to aid in comprehending the nature of the sea floor and the crustal structure. The biological program is designed to increase knowledge of the abundance and distribution of living organisms and to gather information leading to a better understanding of the biological resources of the Indian Ocean. A new research vessel Atlantis II was launched in September 1962 which will be used in the Indian Ocean Expedition, built with funds provided by the Foundation. Several grants were made during the fiscal year 1962 for various activities in oceanography and marine studies.

OUTDOOR RECREATION BUREAU: H. R. 3541 (Morris) introduced in House Feb. 7, 1963, to promote the coordination and development of effective Federal and State programs relating to outdoor recreation, and for other purposes; referred to the Committee on Interior and Insular Affairs.

PRICE-QUALITY STABILIZATION: H. R. 3669 (Harris), H. R. 3670 (Madden), H. R. 3690 (Harris), H. R. 3701 (Nelsen), H. R. 5143 (Tollefson), and H. R. 3745 (Mrs. May) introduced in House Feb. 11, 1963, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to the Committee on Interstate and Foreign Commerce. Also H. R. 3790 (Pelly) and H. R. 3797 (Toll) introduced Feb. 14, 1963, and H. R. 3849 (Cederberg) and H. R. 3863 (Holifield), Feb. 18, 1963; referred to the Committee on Interstate and Foreign Commerce.

SALMON RIVER ANADROMOUS FISH: H. R. 3853 (Dingell) introduced in House Feb. 18, 1963, to provide for the conservation of anadromous fish and spawning areas in the Salmon River, Idaho; referred to the Committee on Interstate and Foreign Commerce.

SCIENCE AND TECHNOLOGY COMMISSION: S. 816 (McClellan et al) introduced in Senate Feb. 18, 1963, for the establishment of a Commission on Science and Technology; referred to the Committee on Government Operations. Commission would be composed of representatives from the legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. Provides for a study of all of the programs, methods and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs, with the objective of bringing about more economy and efficiency in the performance of these essential activities and functions.

SMITHSONIAN INSTITUTION & MARINE & AQUATIC BIOLOGICAL RESEARCH: H. R. 3499 (Dingell) introduced in House Feb. 7, 1963, to authorize expanded programs of marine and aquatic biological research by the Smithsonian Institution, and for other purposes; referred to the Committee on House Administration.

STERN RAMP TRAWLERS: S. 744 (Magnuson et al) introduced in Senate Feb. 7, 1963, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for experimental commercial fishing, research, and for other purposes; referred to the Committee on Commerce.

SUBMERGED LANDS ACT: H. R. 3473 (Boggs), H. R. 3474 (Hebert), H. R. 3475 (Long), H. R. 3476 (Morrison), H. R. 3477 (Passman), H. R. 3478 (Thompson), H. R. 3479 (Waggoner), and H. R. 3480 (Willis) introduced in House Feb. 7, 1963, to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources within said boundaries; all referred to the Committee on the Judiciary.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: H. R. 2888 (Lankford) introduced in House Jan. 28, 1963, to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected includes the site of the Bureau

of Commercial Fisheries Technological Laboratory at College Park, Md. Bill referred to the Committee on Interior and Insular Affairs. A companion bill S. 673 (Beall & Brewster) was introduced in Senate Jan. 15, 1963; referred to the Committee on Interior and Insular Affairs.

TRADE EXPANSION ACT OF 1962: H. Doc. 51, Sixth Annual Report of the President of the United States on the Trade Agreements Program (A message from the President of the United States Transmitting the Sixth Annual Report on the Operation of the Trade Agreements Program, Pursuant to Section 402 (a) of the Trade Expansion Act of 1962, 88th Congress, 1st Session), 103 pp., printed. Contains the following: (I) Developments in international trade in 1961; (II) The trade agreements program and GATT; (III) United States tariff negotiations; (IV) The safeguarding procedures of the trade agreements program; (V) The Removal of restrictions against U.S. exports; (VI) Developments in regional associations; and Appendices A, B, and C.

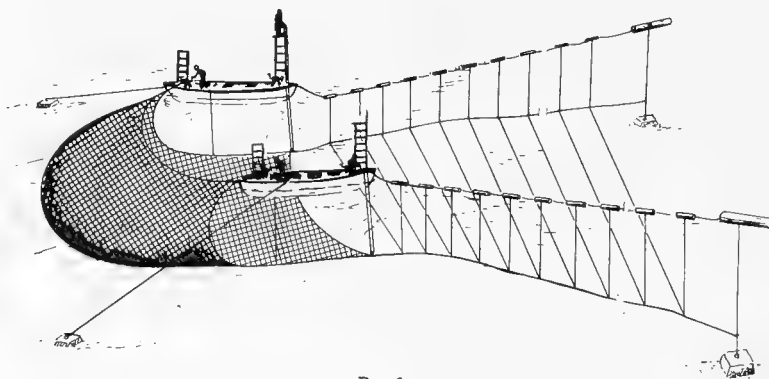
WATER POLLUTION CONTROL ADMINISTRATION: H. R. 3819 (Johnson of Wisconsin) introduced in the House Feb. 14, 1963, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes; referred to the Senate and House Committee on Public Works. Also H. R. 3867 (McFall) introduced Feb. 18, 1963; referred to Committee on Public Works.

WATER POLLUTION CONTROL AID TO INDUSTRY: S. 737 (Ribicoff et al) introduced in Senate Feb. 7, 1963, to promote water and air pollution control and abatement by authorizing the Secretary of Health, Education, and Welfare to provide certain assistance to small business concerns in obtaining necessary treatment works; referred to the Committee on Public Works.



REEF NET

This type of fishing gear is used, mainly by Indians, in the State of Washington. It is fished between the reefs of Puget Sound for salmon. When the salmon are observed to have passed over the square netting in front of the rectangular bunt, the weighted lead line of the square is raised quickly to the surface, impounding the fish. The salmon are guided into the net by leads of ropes.



Reef net.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

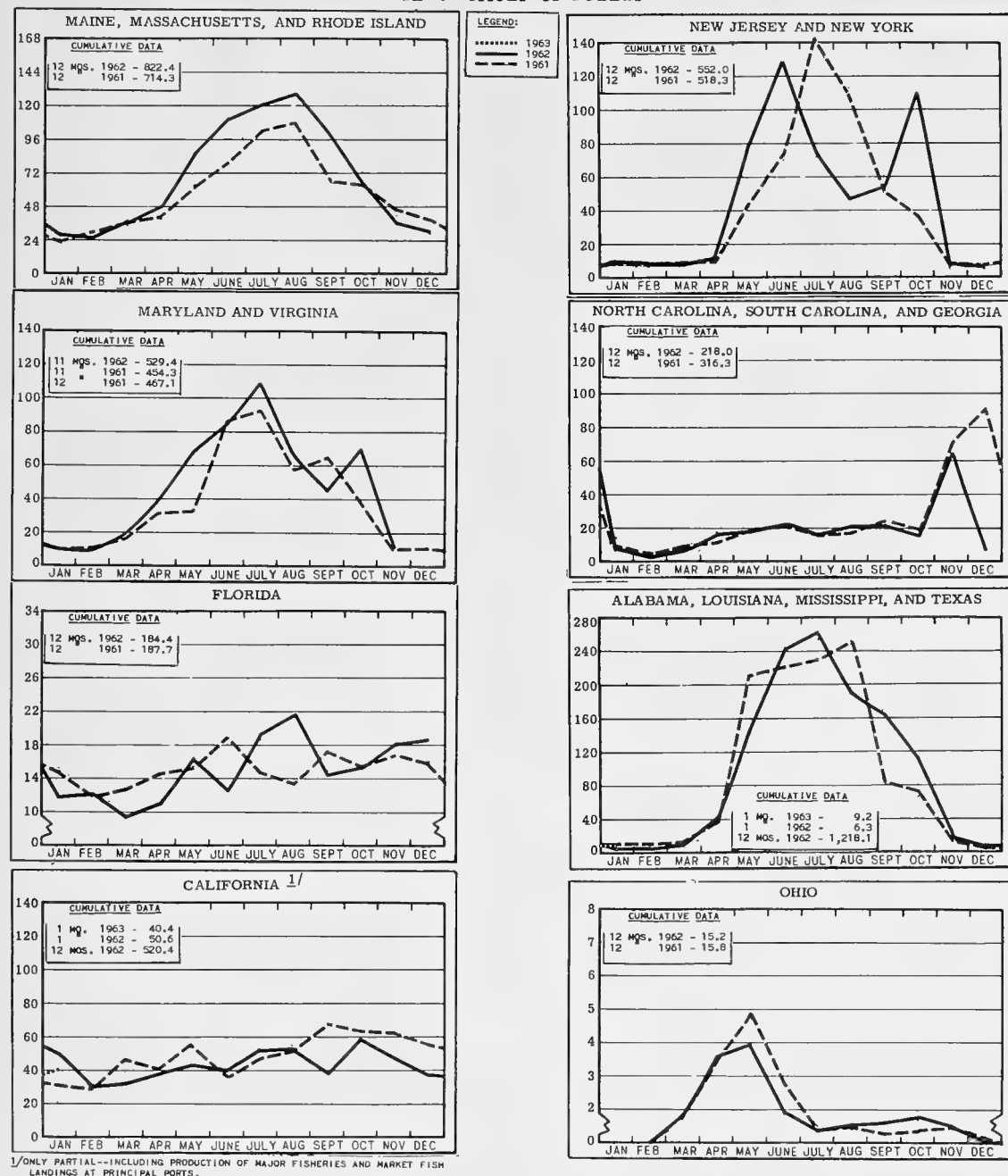
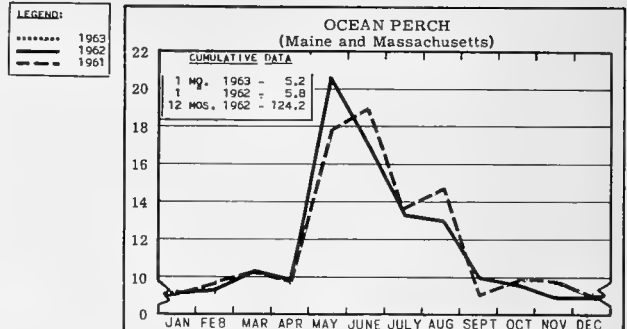
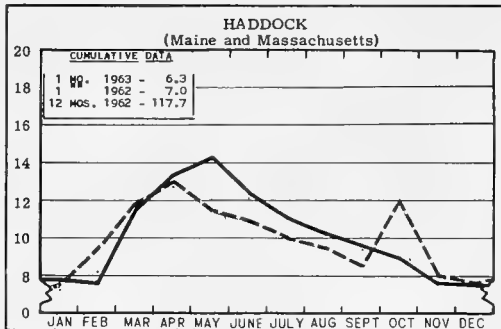
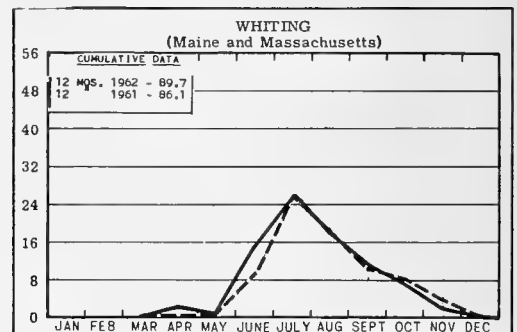
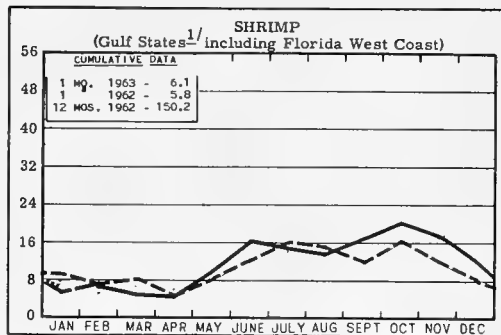


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

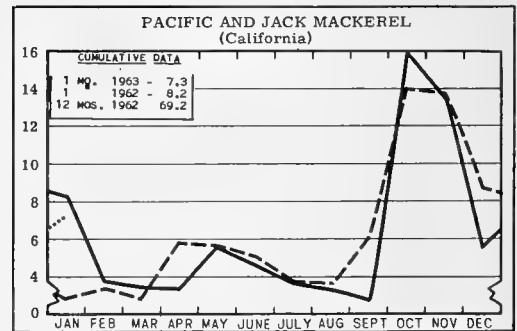
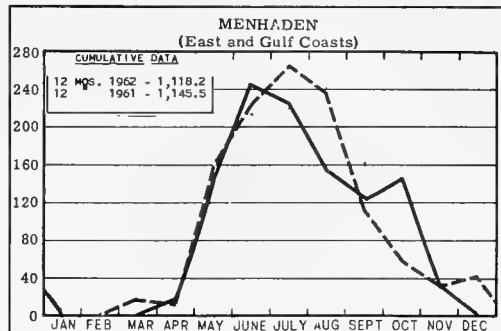


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

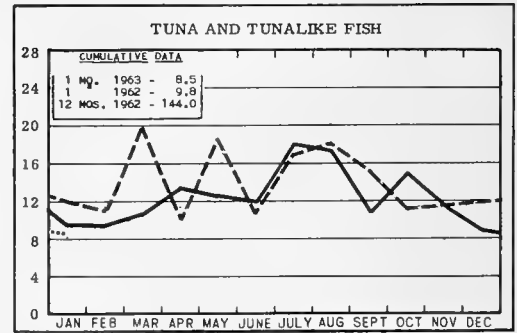
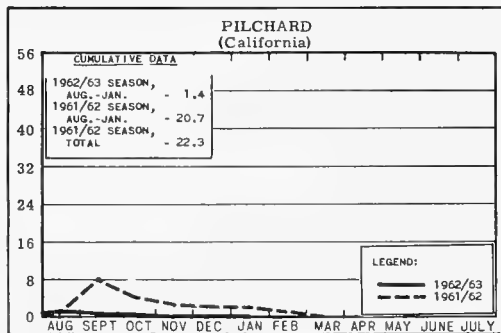
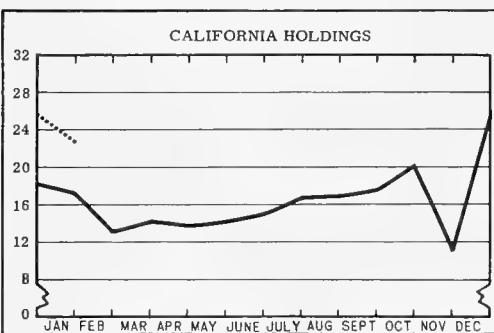
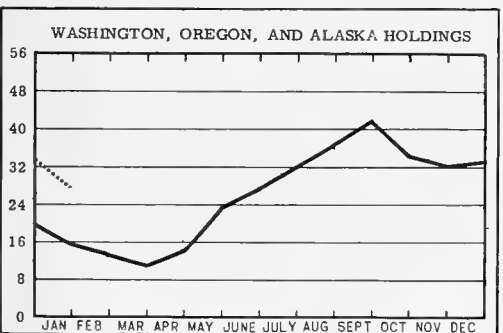
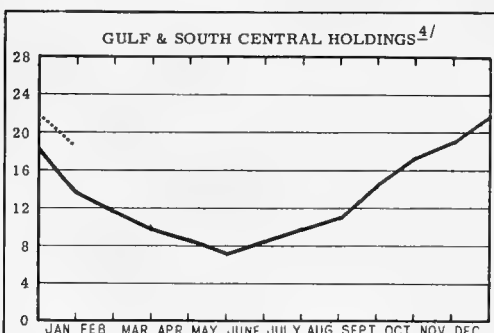
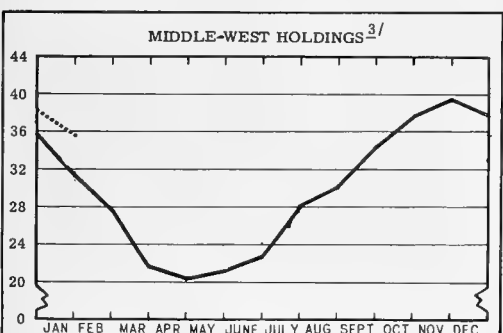
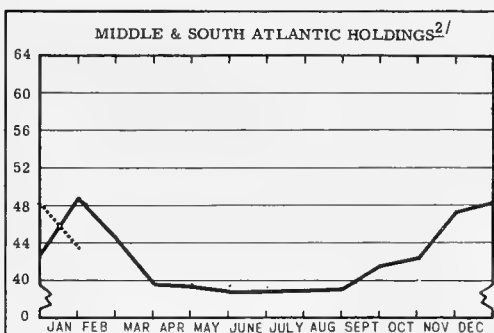
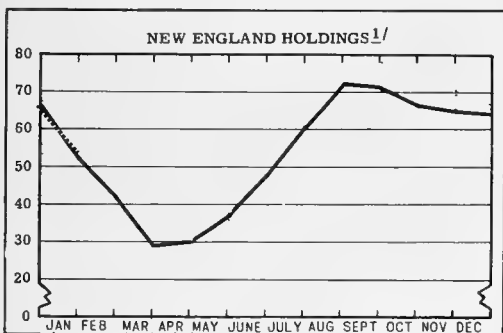
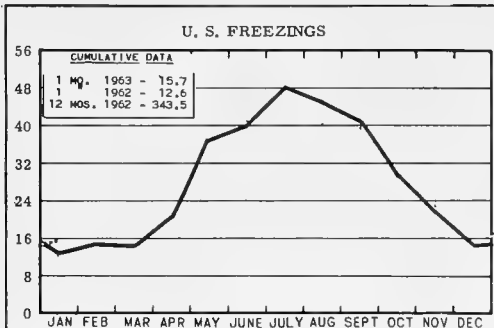
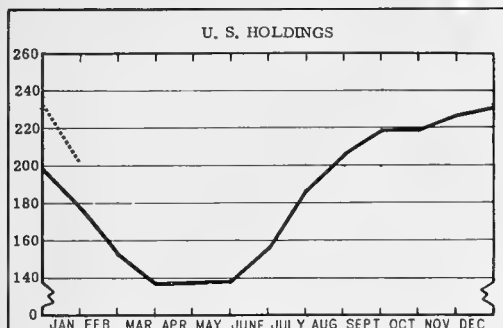


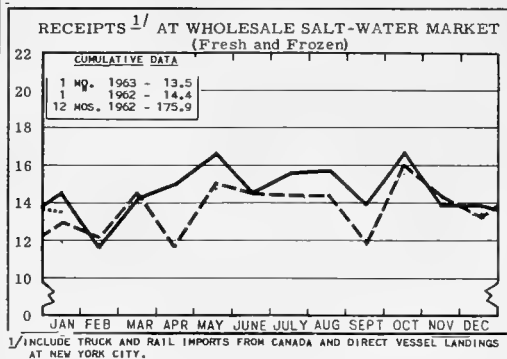
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS * **In Millions of Pounds**



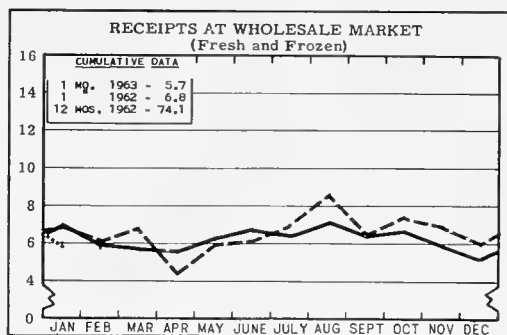
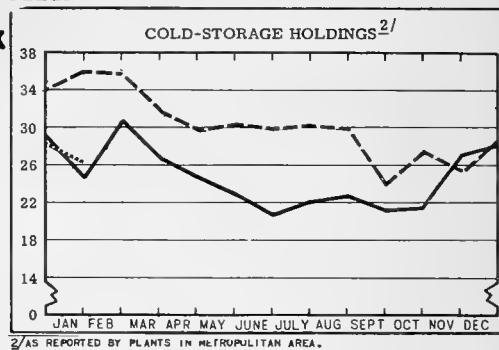
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

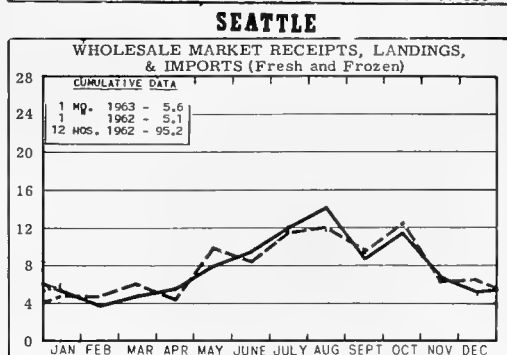
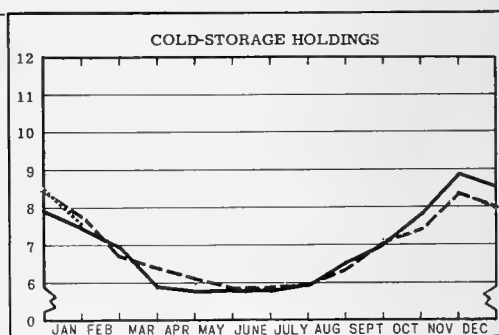
In Millions of Pounds



NEW YORK CITY



CHICAGO



LEGEND:

..... 1963
—— 1962
- - - 1961

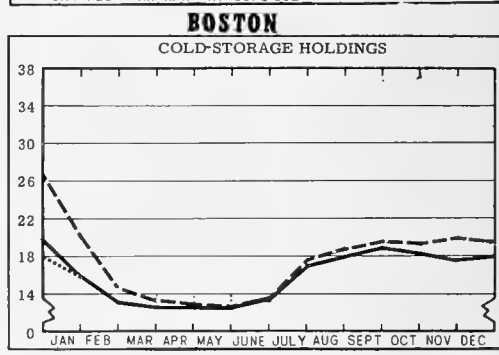


CHART 5 - FISH MEAL and OIL PRODUCTION

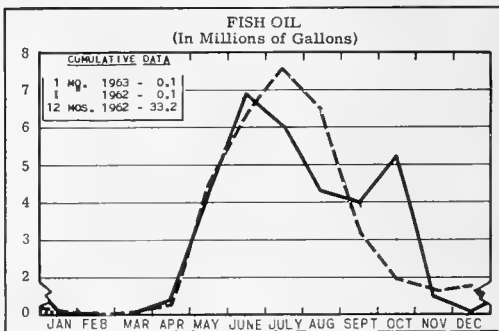
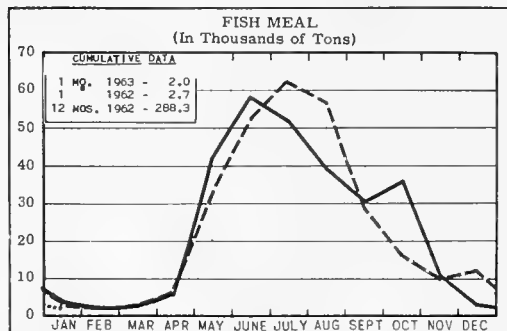
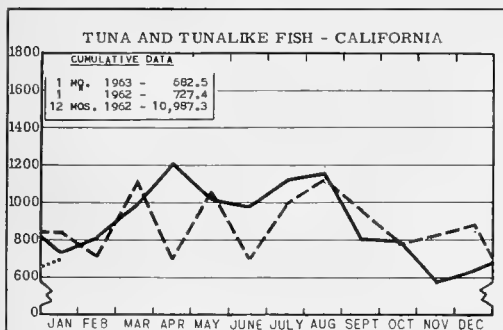
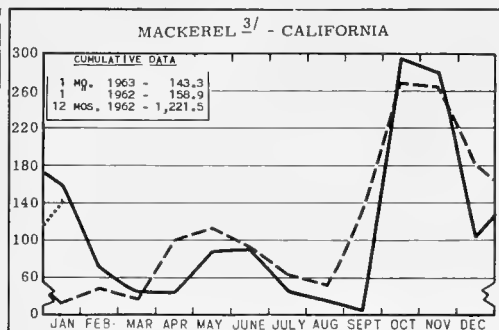


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

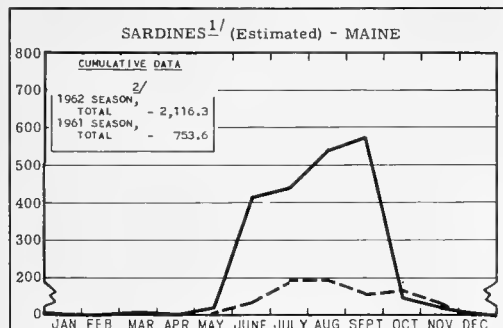
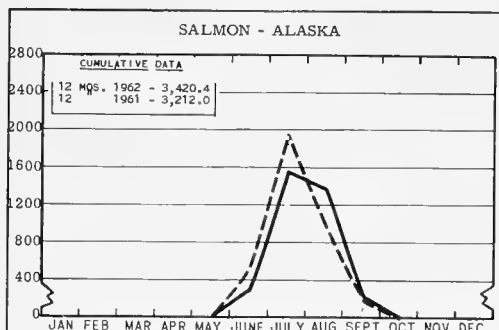
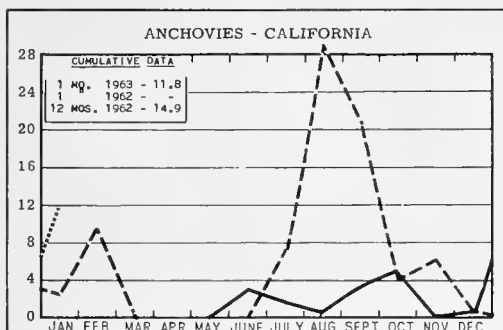
In Thousands of Standard Cases



LEGEND:
 1963
 — 1962
 - - - 1961



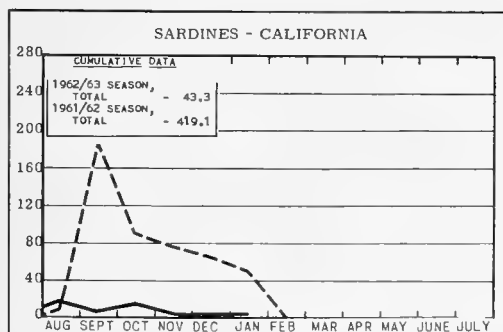
^{3/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	$3\frac{3}{4}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



LEGEND:
 — 1962/63
 - - - 1961/62

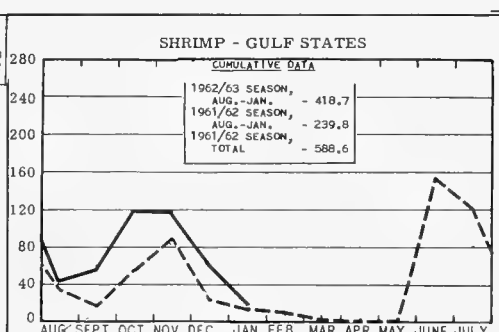
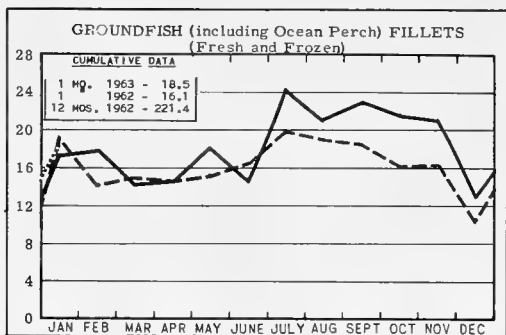
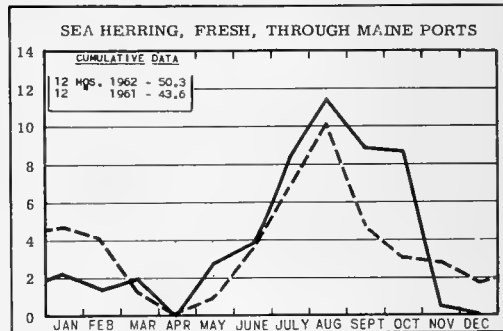
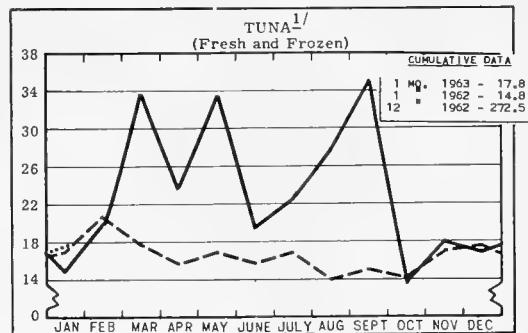
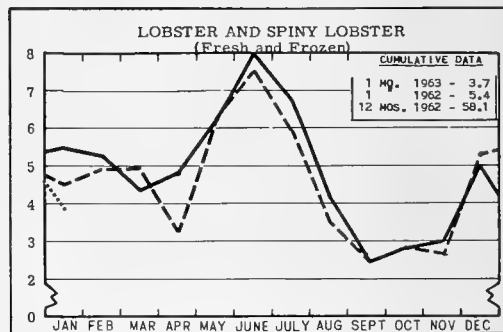
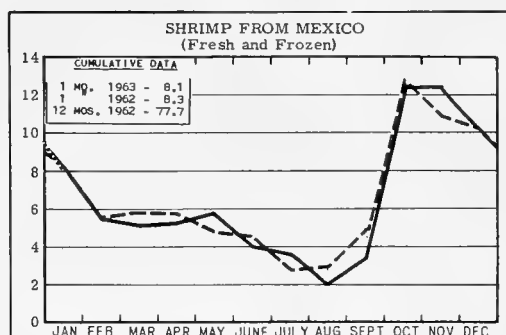
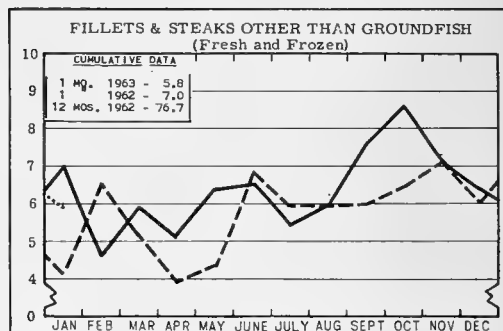


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

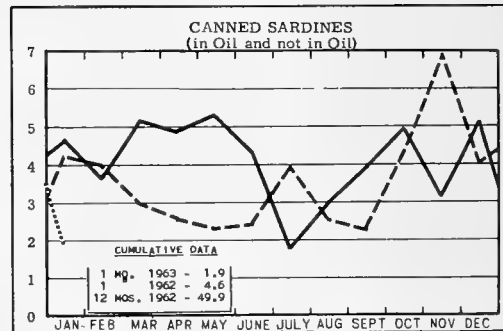
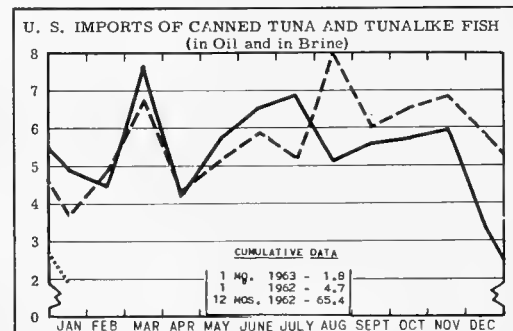
In Millions of Pounds



LEGEND:
 1963
 - - - - - 1962
 - - - - - 1961



^{1/} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
 FL - FISHERY LEAFLETS.
 MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
 SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3051	- Gulf Fisheries, 1961 Annual Summary, 13 pp.
CFS-3052	- New Jersey Landings, October 1962, 4 pp.
CFS-3054	- Alabama Landings, September 1962, 3 pp.
CFS-3055	- Georgia Landings, October 1962, 2 pp.
CFS-3056	- North Carolina Landings, October 1962, 4 pp.
CFS-3060	- Frozen Fish Report, November 1962, 8 pp.
CFS-3061	- South Carolina Landings, October 1962, 2 pp.
CFS-3064	- Massachusetts Landings, July 1962, 5 pp.
CFS-3065	- Texas Landings, September 1962, 3 pp.
CFS-3066	- Michigan Landings, September 1962, 3 pp.
CFS-3067	- Wisconsin Landings, October 1962, 2 pp.
CFS-3068	- Virginia Landings, October 1962, 4 pp.
CFS-3069	- California Landings, September 1962, 4 pp.
CFS-3070	- Ohio Landings, September 1962, 2 pp.
CFS-3071	- New York Landings, October 1962, 4 pp.
CFS-3072	- Mississippi Landings, October 1962, 3 pp.
CFS-3074	- Texas Landings, October 1962, 3 pp.
CFS-3075	- New Jersey Landings, November 1962, 4 pp.
CFS-3076	- Louisiana Landings, October 1962, 2 pp.
CFS-3077	- Rhode Island Landings, October 1962, 3 pp.
CFS-3079	- Alabama Landings, October 1962, 3 pp.
CFS-3081	- North Carolina Landings, November 1962, 4 pp.
CFS-3083	- Ohio Landings, October 1962, 2 pp.
CFS-3084	- Fish Meal and Oil, November 1962, 2 pp.
CFS-3085	- South Carolina Landings, November 1962, 2 pp.
CFS-3086	- Georgia Landings, November 1962, 2 pp.
CFS-3087	- Michigan Landings, October 1962, 3 pp.
CFS-3088	- Wisconsin Landings, November 1962, 2 pp.
CFS-3089	- Louisiana Landings, November 1962, 2 pp.
CFS-3090	- Ohio Landings, November 1962, 2 pp.
CFS-3091	- Maryland Landings, November 1962, 3 pp.
CFS-3092	- Mississippi Landings, November 1962, 3 pp.
CFS-3150	- Advance Report on the Fisheries of the United States, 1962, 25 pp.

FL-508 - Whirling Disease of Trout, by Glenn Lyle Hoffman, 3 pp., May 1962 (Revised).

Sep. No. 667 - A Trawling Survey of Southern Lake Michigan (August-November 1960).

Sep. No. 668 - Gulf States Shrimp Canning Industry.

SSR-Fish. No. 420 - Physical, Chemical, and Biological Observations in the Eastern Tropical Pacific Ocean: Three Cruises to the Gulf of Tehuantepec. 1958-59. by Maurice Blackburn and others, 173 pp., illus., July 1962

SSR-Fish. No. 429 - Estimating Abundance of Pink and Chum Salmon Fry in Prince William Sound. 1957. by Howard D. Tait and James B. Kirkwood, 23 pp., illus., processed, June 1962.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON 5, D. C.

Number	Title
MNL-76	- Japan's Exports of Frozen and Canned Tuna, 1961 and January-June 1962, 20 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products. November 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh - and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, November and December 1962, 18 and 20 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices: ex-vessel prices for cannery fish; for the months indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, October and December 1962, 10 pp. ea., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the months indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, November and December 1962, 14 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 South Canal St., Room 1014, Chicago 7, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, November and December 1962, 8 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1962 and January 1963, 4 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

New England Fisheries--Monthly Summary, November and December 1962, 23 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--November 1962, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analysis of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, December 1962 and January 1963, 7 pp. ea. (Market News Service, U. S. Fish and Wildlife

Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Halibut Commission; landings by otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the months indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Accumulation and Retention of Cesium 137 by Marine Fishes, by John P. Baptist and Thomas J. Price, Fishery Bulletin 206 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 177-187), 15 pp., illus., printed, 15 cents, 1962.

"The Deposition of Tetracycline Drugs in Bones and Scales of Fish and Its Possible Use for Marking," by Douglas D. Weber and George J. Ridgway, article Progressive Fish-Culturist, vol. 24, no. 4, October 1962, pp. 150-155, illus., processed, 25 cents.

Fish, Wildlife, and Clean Water, 19J--Catalog No. FS-26473:F-52/962, 8 pp., printed, 5 cents, revised 1962. Pollution is a growing problem to 50 million American sports fishermen and hunters. This leaflet is intended to show the extent of this problem and its impact on our fish and wildlife.

"Studies of Transmission of Mycobacterial Infections in Chinook Salmon," by A. J. Ross and H. E. Johnson, article, Progressive Fish-Culturist, vol. 24, no. 4, October 1962, pp. 147-149, processed, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AFRICA:

A Note on the Fisheries of Tropical Africa, FAO Fisheries Paper No. 20, 11 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1961.

ALGAE:

"Carbohydrates and Nucleotides in the Red Alga, Porphyraperforata. I--Isolation and Identification of Carbohydrates," and "II--Separation and Identification of Nucleotides," by Jong-Ching Su and W. Z. Hassid (University of California, Berkeley), articles, Biochemistry, vol. 1, May 1962, pp. 468-480, printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Nitrogen Compounds of Algae," by G. P. Serenkov and M. V. Pakhomova, article, Vestnik Moskovskii

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Universitet Serie VI: Biologiia Pochvoved, vol. 15, no. 6, 1960, pp. 15-25, printed in Russian. MGU, Leninskiye gory, Moscow, U.S.S.R.

"Studies on the Compounds Specific for Each Group of Marine Algae. I--Presence of Characteristic Ultraviolet-Absorbing Material in Rhodophyceae," and "II--Extraction and Isolation of Characteristic Ultraviolet-Absorbing Material in Rhodophyceae," by Isami Tsujino and Tsuneyuki Saito, articles, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, May 1961, pp. 49-65, printed. Hokkaido University, Kameda-Machi, Hakodate, Japan.

BACTERIOLOGY:

"Bacteriology: Collection of Marine Bacteria," article, Torry Research Station, Annual Report 1960, pp. 28-29, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"Bacteriology: Effect of Temperature on the Multiplication of Marine Bacteria," article, Torry Research Station, Annual Report 1960, pp. 29-30, printed. Torry Research Station, Aberdeen, Scotland, 1961.

Commensal Bacteria of Marine Animals--A Study of Their Distribution, Physiology and Taxonomy, by R. B. R. Colwell, Dissertation for Ph.D., 225 pp., printed. University of Washington, Seattle, Wash., 1961.

BASS:

The Largemouth Bass: Its Life History, Ecology and Management, by Donald Mraz, Stanley Kmiotek, and Ludwig Frankenberger, Publication No. 232, 15 pp., illus., printed. Wisconsin State Conservation Department, Madison, Wis., 1961.

BLUEGILL:

The Bluegill: Its Life History, Ecology and Management, by Howard Snow, Arthur Ensign, and John Klingbiel, Publication No. 230, 14 pp., illus., printed. Wisconsin State Conservation Department, Madison, Wis., 1960.

BRAZIL:

"Decree No. 50,872 Establishing the Fisheries Development Council and Making Other Provisions," FAO--Food and Agricultural Legislation, vol. XI, no. 1, September 1, 1962, Brazil, XVIII/I, 10 pp., printed, \$1. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y. Covers the provisions of Brazil Decree No. 50,872, June 28, 1961 (Diario Oficial, Year C, No. 144, June 28, 1961, p. 5849). Describes the establishment of the Fisheries Development Council (Conselho de Desenvolvimento da Pesca--CODEPE), its aims, component bodies and their functions, and related information.

CANADA:

Annual Report of the Fisheries Research Board of Canada, 1961/62 (For the Fiscal Year Ended March 31, 1962), 206 pp., illus., printed in English, introduction also in French, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1962. A comprehensive summary of the work of the Fisheries Research Board of Canada

and its field stations during 1961/62. The research work of the Board is divided into three principal areas: aquatic biology with emphasis on fishery biology, fishery technology, and oceanography. Cooperative programs with other Canadian as well as international agencies were conducted during the year. A new research vessel was under construction and another in the planning stage. Oceanographic studies in Atlantic, Arctic, and Pacific waters are described in the report. Also covered are activities of the Board's biological and technological stations. A list of the publications and reports published during 1961 by the Board is included.

Journal of the Fisheries Research Board of Canada, vol. 19, no. 6, November 1962, 205 pp., illus., printed, single copy C\$1.50. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, articles on: "Bacteriological Studies of Freshwater Fish. II--Furunculosis in Ontario Fish in Natural Waters," by L. Rabb and L. A. McDermott; "Relation between Water Temperature and Gastric Digestion of Large-Mouth Bass (*Micropterus salmoides* Lacepede)," by Gyula Molnar and Istvan Tolg; "The Occurrence of the Longjaw Cisco, *Leucichthys alpenae*, in Lake Erie," by W. B. Scott and Stanford H. Smith; "Some Considerations in the Study of Respiratory Metabolism in Fish, Particularly Salmon," by J. R. Brett; "An Improved Method for the Preparation of Fish Protein Concentrate from Cod," by H. E. Power; "Aggressive Behavior in Juvenile Coho Salmon as a Cause of Emigration," by D. W. Chapman; "The Free Fatty Acids of Cod Oil. 1--Anomalous Composition by Fatty Acid Chain Length," by R. G. Ackman, R. D. Burgher, and M. L. Hughes; "The Relative Efficiency of Nylon and Cotton Gill Nets for Taking Lake Trout in Lake Superior," by Richard L. Pycha; "The Enzymic Digestion of Cod Tropomyosin," by B. Truscott and others; "Amphipods in Low-Oxygen Marine Waters Adjacent to a Sulphite Pulp Mill," by M. Waldichuk and E. L. Bousfield; "Range Extension for Two Species of Caridean Shrimps (Order Decapoda) from the North-eastern Pacific," by Lael L. Ronholt; "Egg Masses and Early Development Stages of the Scorpaenid Fish, *Sebastes*," by W. G. Pearcy; and "Age of Young Sablefish, *Anoplopoma fimbria* (Pallas) 1811," by H. Heyamoto.

Progress Reports of the Atlantic Coast Stations, no. 73, 73 pp., illus., printed in English with summaries in French, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, August 1962. Contains, among others, the following articles: "The Utilization of Fish Skins for Glue and Other Products," by A. Guttmann; "Sea Temperatures Along the Canadian Atlantic Coast, 1958-1960," by L. M. Lauzier and J. H. Hull; and "Salt-Fish Flavour in Frozen Cod Fillets Prepared from Stored Frozen Shore Cod Thawed in Sea Water," by W. J. Dyer and others.

CLAMS:

"The Quahog," by Robert E. Hillman, article, Estuarine Bulletin, vol. 7, no. 1, January 1963, pp. 13-15, illus., printed. University of Delaware, Department of Biological Sciences, Newark, Del. The Northern Quahog, *Mercenaria mercenaria*, unlike other sand-dwelling clams, has a self-cleansing process which

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enables it to free itself of debris. Epicures who relish the cherry stone stage of this clam note that it rarely contains sand. The quahog has a unique fourth fold in its mantle which traps foreign particles, wraps them in mucus, and exudes them between the mantle margins out across the shell.

COMPOSITION:

"Mineralnyi sostav nekotorykh vidov ryby i proverka sootnoseniia mezdu soderzaniem mineral'nykh elementov i belka" (Mineral Composition of Some Species of Fish and Relations between Contents of Minerals and Proteins), by E. N. Vasil'eva, N. E. Diubuk, and T. D. Lycinikova, article, Voprosy Pitaniia, vol. 20, no. 2, 1961, pp. 54-59, printed in Russian with English summary. Voprosy Pitaniia, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow, U.S.S.R.

"Soderzanie mineral'nia elementov v miase ryb" (Mineral Content of Fish Flesh), by N. E. Kasinova, article, Voprosy Pitaniia, vol. 20, 1961, pp. 74-77, printed in Russian with English summary. Voprosy Pitaniia, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow, U.S.S.R.

"Total Solids and Ether Extract in Fish and Other Marine Products," by H. M. Risley, article, Journal of the Association of Official Agricultural Chemists, vol. 45, May 1962, pp. 259-261, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

CRAB MEAT:

Preservation of Canned Crab, British Patent, 870,926, June 21, 1961, printed. British Patent Office, 25 Southampton Bldgs., London WC2, England.

"The Prevention of Blue Discoloration of Frozen Crab Meat and Canned Crab Meat by Fractional and Low Temperature Cooking Methods," by I. Osakabe, article, Refrigeration (Japan), vol. 36, no. 409, November 1961, pp. 18-49, illus., printed in Japanese with English summary. Refrigeration, Japanese Association of Refrigeration, Kenchiku Kaikan Bldg., 3-1 Ginza Nishi, Chuo-ku, Tokyo, Japan.

CRABS:

A Partial Bibliography on Some Crabs of Commercial Importance, by M. A. Benarde, FAO Fisheries Biology Technical Paper No. 17, 5 pp., processed. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, 1961.

DEFROSTING:

"Electronics Speed Defrosting," by John Grindrod, article, Food Engineering, vol. 34, May 1962, p. 128, printed. Chilton Company, Chestnut and 46th Sts., Philadelphia 36, Pa.

DENMARK:

Kongeriget Danmarks Fiskeribank--Beretning og Regnskab for 29. Regnskabsar (1. April 1961-31. Marts 1962) (Kingdom of Denmark Fisheries Bank--Report and Statement for 29th Fiscal Year--April 1, 1961-March 31, 1962), 8 pp., printed in Danish. Kongeriget Danmarks Hypotekbank, Niels Juels Gade 5, Copenhagen K, Denmark.

DRYING:

"Solar Drying Devices May Save Money in Fishing," article, Canadian Fisherman, vol. 48, no. 10, 1961, p. 23, printed. Canadian Fisherman, National Business Publications Ltd., Gardenvale, Quebec, Canada.

EAST AFRICA:

Annual Report of the East African Marine Fisheries Research Organization, 1961, 17 pp., illus., printed, 4s. (about 56 U.S. cents). East African Common Services Organization, Zanzibar, Zanzibar, 1962. Discusses activities of the East African Marine Fisheries Research Organization during 1961; the Organization's research vessels; a Rockefeller Foundation grant; and the International Indian Ocean Expedition. Also covers the scientific work accomplished: pelagic fish--deep long-line operations, surface shoaling fish, and sardine investigations; demersal fish--fisheries of the North Kenya Coast; inshore and estuarine fisheries--shrimps, spiny lobsters, crustacean taxonomy and biology, and fish stomach contents; plankton studies; and hydrological investigations.

EGYPT:

Import Tariff System of Egypt (U.A.R.), by Robison H. Barber, OBR-62-8, 2 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers units of currency, weights, and measures; ad valorem duties; specific duties; method of payment of duty; and sales and other internal taxes. Also discusses preferential duties, consular documents and fees, trade restrictions, and special regulations.

FACTORYSHIP:

"Large Japanese-Built Refrigerating Factory Ship," article, Motor Ship, vol. 42, no. 495, 1961, pp. 304-306, illus., printed. Motor Ship, Temple Press Ltd., Bowling Green Lane, London EC4, England.

FILLETS:

"Fat Hydrolysis in Frozen Fillets of Lingcod and Pacific Gray Cod," by J. D. Wood and S. A. Haqq, article, Journal of the Fisheries Research Board of Canada, vol. 19, no. 1, January 1962, pp. 169-171, illus., printed. Journal of the Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada. (For sale by Queen's Printer and Controller of Stationery, Ottawa, Canada.)

FISH AS EXPERIMENTAL ANIMALS:

Maintaining Fishes for Experimental and Instructional Purposes, by William M. Lewis, 100 pp., illus., printed, \$5.00 cloth, \$1.45 paper. Southern Illinois University Press, Carbondale, Ill., January 1963. The selection and maintenance of fish for experimental purposes has always been a problem for research workers. Fish as experimental animals have contributed to our knowledge not only of fish but of animal science in general. There isn't too much information readily available on the use of fish as experimental animals. The author, in my opinion, has succeeded in bringing together some of the important elements (like nutrition, disease, and the artificial maintenance of suitable environmental conditions) associated with this problem. Only fresh-water

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fish are covered. After a discussion of the types of waters and fish-holding procedures, there is a chapter on the aquarium building and another on the selection of experimental fish. Food, diseases, parasites, and special problems in handling fish are covered. There are chapters on aquarium plants and other miscellaneous considerations (including control of reproduction, anesthetization, sterilization of tanks and equipment); chemical variables of aquarium water and their determination; and the transport of live fish. An appendix contains a number of conversion tables. The literature cited section seems to contain the relevant literature on the subject of the book. An index is also included. This book would be useful to anyone maintaining live fish for experimental or other purposes.

--Joseph Pileggi

FISH COOKERY:

Catch 'em and Cook 'em, by Bunny Day, 111 pp., illus., printed, Doubleday and Company, Inc., Garden City, N. Y., 1961. Presents, with flashes of wit, information on catching, opening, cleaning, and cooking shellfish. Includes sections on clams, crabs, lobster, mussels, oysters, and scallops. Also includes lists of gadgets for cooking and catching shellfish, and recipes for a bouillabaisse and shellfish sauces.

FISH CULTURE:

"Foundation Studies in Culturing of the Japanese Loach, *Misgurnus anguillicaudatus* (Cantor). III--Storing of Spermatozoon," by Z. Kubota; and "V--Sex Reversal Induced by Follicular Hormone," by Z. Kubota and others, articles, Journal of the Shimonoseki College of Fisheries, vol. 11, no. 1, 1961, pp. 247-269, and pp. 287-295, respectively, illus., printed in Japanese with English summary. Shimonoseki College of Fisheries, Jamaguchi Prefecture, Yoshimi, Shimonoseki, Japan.

FISH FINDER:

"Explorator" a French Horizontal Shoal Detector," article, Norwegian Fishing and Maritime News, vol. 9, no. 2, 1962, pp. 33, 35, printed. Norwegian Fishing and Maritime News, Torolf Holme, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

FISH LIVERS:

"Steryilizatsia pecheni treski v balonakh na traulere i prigotovlenie iz nee konservov" (Sterilization of Cod Livers Aboard and the Production of Cod Liver Preserves), by K. A. Mrochkov, article, Tekhnologiya Rybnikh Produktov, vol. 60, 1959, pp. 38-45, illus., printed in Russian. Four Continent Book Corp., 156 5th Ave., New York 10, N. Y.

FISH OIL:

"The Effect of Fish-Oil Fraction on Plasma Lipids," by L. W. Kinsell and others (Institute for Metabolic Research, Oakland, Calif), article, Diabetes, vol. 10, 1961, pp. 316-319, printed. American Diabetes Association, 1 E. 45th St., New York 17, N. Y.

"A Hypercholesterolemic Factor in Marine Sterols," by E. Reiner, D. R. Idler, and J. D. Wood, article, Canadian Journal of Biochemistry and Biophysics, vol. 38, 1960, pp. 1499-1550, printed. Canadian Journal of Biochemistry and Biophysics, National Research Council, Ottawa, Canada.

FISH PROTEIN CONCENTRATE:

"Microbiological Process for the Production of a Bland Fish Meal," by S. G. Wiechers, F. Schweigart, and M. K. Rowan, article, Research Report, Council of Scientific and Industrial Research, South Africa, No. 179, 1960, 21 pp., printed. Council of Scientific and Industrial Research, P. O. Box 395, Pretoria, South Africa Republic.

"Preparation of Edible Fish Flour from Oil-Sardine (*Clupea longiceps*)," by N. L. Lahiry and others, article, Food Science (India), vol. 11, 1962, pp. 37-39, printed. Central Food Technological Research Institute, Mysore, India.

"Preparation of Protein-Rich Biscuit with Fish Flour from Hammer-Head Shark (*Zygoena blochii*)," by R. L. Nath, N. K. Ghosh, and R. Dutt, article, Bulletin, Calcutta School of Tropical Medicine, vol. 9, 1961, pp. 12-13, printed. Calcutta School of Tropical Medicine, Chittaranjan Ave., Calcutta 12, India.

"Use of Fish-Protein Hydrolysate in the Diet. I--Preparation of Biscuit from Protein Hydrolysate of Fish," by R. L. Nath, S. K. Pain, and R. Dutt, article, Journal and Proceedings of the Institution of Chemists (India), vol. 33, 1961, pp. 64-68, printed. Chemical Department, Medical College, Calcutta 12, India.

FISH SAUSAGE:

"Fish Sausage Processing in Japan," by Keishi Amano (Marine Food Preservation Division, Tokai Regional Fisheries Research Laboratory, Ministry of Agriculture and Forestry, Tokyo, Japan), article, Fishing News International, vol. 1, no. 5, October 1962, pp. 29-30, 32-34, illus., printed, single copy 6s. 6d., (about 91 U. S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses the increased production of fish sausage in Japan since 1954, raw materials used, steps in preparation and processing, recipes, shelf life of the product, quality control, and chemical composition.

FISH SOLUBLES:

Animal Feed from Fish Solubles, by J. Kruss, U. S. Patent No. 2,986,469, May 30, 1961, printed. U. S. Patent Office, Washington 25, D. C.

Studies on an Unidentified Growth Factor (UGF) for Chicks in Fish Solubles (Paper presented at the 50th Annual Meeting of the Poultry Science Association, Pennsylvania State University, August 8-11, 1961), by F. H. Steinke, H. R. Bird, and F. M. Strong, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio. (Abstract in Poultry Science, vol. 40, 1961, pp. 1460-1461.)

FISH STICKS:

"Microbial Analysis of Commercial Frozen Fish Sticks," by J. T. R. Nickerson and others (Massachusetts Institute of Technology, Cambridge, Mass.), article, Journal of Milk and Food Technology, vol. 25, no. 2, 1962, pp. 45-47, printed. International Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

FOOD:

"Chemical Opening of Bivalves for the Removal of Edible Meats," by Clyde J. Welcker and Roland L.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Welcker, article, Chemical Abstracts, vol. 56, April 2, 1962, 7761i. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

Fish as Food. Vol. II--Nutrition, Sanitation, and Utilization, edited by Georg Borgstrom, 794 pp., illus., printed, \$25. Academic Press Inc., 111 Fifth Ave., New York 3, N. Y., November 1962. This is the second of a three-volume work which reviews today's science of fish as food (covers all marine and fresh-water organisms used as food). The basic fields of production, biochemistry, and microbiology were reviewed in the first volume. Presented in this second volume are the "public health" aspects of fish, its handling and processing. Covered are the major areas of nutrition, sanitation, and utilization. The historical aspects of fish are discussed in the first chapter. The section on nutrition covers the nutritive aspects of fish and shellfish protein (including protein content, amino acid composition, digestibility, fish flour, fish and shellfish meals, fish solubles, and whale protein). Also, the same section discusses nutritive aspects of fish oils, fat-soluble vitamins, fish as a source of mineral nutrition, and changes in nutritive value through handling and processing procedures. Following a chapter on fish in world nutrition are chapters on the role of fishery foods in the Japanese diet; fish meal and condensed solubles in poultry and livestock feeding; and fish for feeding minks. The sanitation section reviews food poisoning caused by fish and fishery products; fish-borne food poisoning in Japan; polluted waters and the contamination of fish; salmonella problems in the sea; biotoxins, allergies, and other disorders; diseases of marine and fresh-water fish; transportation of live fish; and radioactivity and seafood. The section on trends in utilization of fish and shellfish includes all types of fishery products, utilization patterns in selected countries, waste utilization, trade patterns, and many other phases. Very successfully the book maps the alternative ways that fish, as food, reaches the consumer as well as the relative significance of major preserving and processing methods. In the preface, the author points out: "The prevailing idea that fisheries contribute little to human feeding is substantially revamped when the character of fish as a rich source of protein and its great marginal effect in amino acid supplementation is properly considered." Besides a subject index, this volume contains a list of common food fish, and each chapter is followed by a list of references. This particular volume as well as the first volume should be valuable to fish and food scientists, public health workers, fishery biologists, nutritionists, sanitary engineers, and to anyone interested in any phase of fish and shellfish production and processing. No fishery library will be complete without this set of books, to which most of the world's leading fish scientists have contributed. Of particular importance is the inclusion of Soviet and Japanese studies previously unavailable in English. (See Commercial Fisheries Review, September 1962, p. 132, for review of Volume I.)

--Joseph Pileggi

FOOD AND AGRICULTURE ORGANIZATION:

Yearbook of Fishery Statistics, 1960-61 (International Trade), vol. XIII, 539 pp., processed in English,

French, and Spanish, \$5. Food and Agriculture Organization of the United Nations, Rome, Italy, 1962. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) The present biennial issue brings up to date the statistics relating to international trade in fishery products, up to and including the 1960-61 biennium. The coverage of this volume has been extended by adding approximately 20 countries now comprising import and export data for 125 countries or customs territories. Mainland China remains the only fishing country with significant exports still omitted from the Yearbook. According to the report, the volume of international fishery trade in 1961 was over 4,300,000 tons and its value between \$1,300 and \$1,400 million. Into these 4,300,000 tons of fishery products went approximately 11,800,000 tons of fish as they come out of the water, i.e., one third of the estimated world catch for 1961.

Yearbook of Fishery Statistics, 1961 (Production), vol. XIV, 423 pp., illus., processed in English, French, and Spanish, \$4.50. Food and Agriculture Organization of the United Nations, Rome, Italy, 1962. (For sale by the Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) This edition contains all sections that appeared in the 1960 edition except for that pertaining to fishing craft. It covers fishery statistics on catches, production of preserved and processed commodities, and whaling by countries. It reports that "The total nominal catch of fish, crustaceans and molluscs and other aquatic animals (except seals and whales), residues and aquatic plants, throughout the world in 1961 is estimated at over 41 million metric tons, an increase of 8 percent over the nominal catch of 1960, and is once more greater than in any other year. Out of this total of over 41 million tons, nearly 10 million tons were used for the manufacture of fish meals for animal feeding, and approximately another million tons for miscellaneous purposes. The balance of approximately 30 million tons was used for human food in fresh, frozen, cured, or canned form."

FOREIGN TRADE:

"Commerce Leads Way--Trade Expansion Act of 1962 is Law," by Luther H. Hodges; "Trade Act Details," by Harold T. Lamar, articles, International Commerce, vol. 68, no. 19, October 22, 1962, pp. 2-6, printed, single copy 35 cents. U.S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) Discusses the impact of the Trade Expansion Act of 1962 on the United States as well as on the international economy and explains details of the Act and how it will operate. The Act was signed into law on October 11, 1962, extending the authority of the President to enter into trade agreements and to modify import restrictions for a period of 5 years ending June 30, 1967. Congress grants to the President adequate authority to deal with the problems and challenges facing the United States in its trading relations with other countries. This will assure expanded export opportunities in the growing markets abroad, which will benefit American industry, agriculture, and labor, according to the authors.

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FRANCE:

"La Pêche Industrielle" (Commercial Fishing), by F. Dorville, article, Revue Maritime, No. 183, 1961, pp. 1563-1577, illus., printed in French. Département des Pêches Maritimes, Société MacGregor-Comarain, Paris, France.

FREEZE-DRYING:

"Accelerated Freeze-Drying of Food," by S.W.F. Hanson, article, New Scientist, no. 304, September 13, 1962, pp. 570-572, illus., printed. New Scientist Cromwell House, Fulwood Place, High Holborn, London WC1, England.

"Freeze-Drying in the Food Industry," by L. Rey, article, Revue Generale du Froid, vol. 39, no. 3, March 1962, pp. 355-360, printed in French. Revue Generale du Froid, Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

"Freeze-Drying: What It Is and What It Costs," by E.P. Mehrlich, article, Canadian Refrigeration and Air-Conditioning Journal, vol. 28, no. 2, February 1962, pp. 14-17, illus., printed. Canadian Refrigeration and Air-Conditioning Journal, National Business Publications Ltd., 137 Wellington St. W., Toronto, Canada.

Optimum Processing Conditions for Freeze-Drying (Paper presented at the 21st Annual Meeting of the Institute of Food Technologists, New York, May 7-11, 1961), by W.R. Smithies (Defence Research Medical Laboratories, Toronto, Canada), printed. Institute of Food Technologists, 510 No. Hickory St., Champaign, Ill. (Abstract in Food Trade Review, vol. 31, no. 6, 1961, p. 56.)

Progres recents en lyophilisation (Recent Advancement in Freeze-Drying), by L. Rey and others, 196 pp., illus., printed in French, NF33 (about US\$6.75). Hermann, 115 Blvd. St. Germain, Paris 6^e, France.

The Stability of Freeze-Dried Foods, by R.M. Ballantyne, T.S. Blakley, and others, Defence Research Medical Labs. rpt. no. 232-11, 10 pp., printed. Defence Research Board, Medical Research Section, 125 Elgin St., Ottawa, Canada, February 1962. Results of organoleptic tests on stored freeze-dried raw meats, cooked meats, fish, vegetables, and fruits are given. An estimate is given of the storage life of a variety of products.

FREEZING:

"Freezing and Cold Storage," article, Torry Research Station, Annual Report 1960, pp. 18-19, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"The Freezing of Crustacea," by J. Deniel, article, Revue Generale du Froid, vol. 39, no. 1, January 1962, pp. 33-37, illus., printed in French. Revue Generale du Froid, Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

"Über das Gefrieren von seefischen" (On the Freezing of Salt Water Fish), by J. Gutschmidt, article, Kalttechnik, vol. 13, no. 6, June 1961, pp. 216-225, illus., printed in German. Kalttechnik, C.F. Muller Verlag, Karlsruhe, Germany.

FROZEN FISH:

"Freezing and Cold Storage: Quality of Frozen, Packaged Fish in Shops," article, Torry Research Station, Annual Report 1960, pp. 20-21, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"Protein Denaturation in Frozen Fish. Cold Storage Studies on Cod Using the Cell Fragility Method," by R.M. Love, article, Journal of the Science of Food and Agriculture, vol. 13, no. 5, May 1962, pp. 269-278, illus., printed. Journal of the Science of Food and Agriculture, The Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

"Reducing Moisture Loss from Frozen Meat and Fish," by Thomas Reid Anderson, article, Chemical Abstracts, vol. 55, December 11, 1961, 26307c, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

GEAR:

"A Note on the Night Fishing Observations from a 'Kelong'," by E.D. Chelappa, article, Journal of the Marine Biological Association of India, vol. 1, no. 1, 1959, pp. 93-94, printed. Central Marine Fisheries Research Institute, Marine Fisheries (P.O.), Madras, India.

"Le Rolling-bowl dispositif de levage pour bolinche ou filets tournants" (The "Rolling-Bowl," a Hauling Gear for Seine Nets), article, Pêche Maritime, vol. 40, no. 1001, 1961, pp. 592-593, illus., printed in French. La Pêche Maritime, 190, Boulevard Haussmann, Paris, France.

"Ovyborie ratsional'noy formy tralovoy doski" (Choosing Rational Shape of Otter Boards), by I.R. Matrosov, article, Rybnoe Khoziaistvo, vol. 34, no. 1, 1958, pp. 36-42, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

GERMAN FEDERAL REPUBLIC:

Jahresbericht über die Deutsche Fischwirtschaft, 1961/62 (Annual Report on German Fisheries, 1961/62), issued by the Ministry of Food, Agriculture, and Forestry in cooperation with the Federal Statistical Office, 316 pp., illus., printed in German with English table of contents and summaries, DM 25 (about US\$6.25). (Available from Gebr. Mann, Hauptstrasse 26, Berlin 62, Germany, 1962.) A review covering all phases of the German fisheries in 1961/62. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply, the German fishing fleet, biological-statistical report on the German deep-sea fishery, and foreign trade in fishery products. Part II includes information on cruises of the fishery protection and fishery research vessels, the fishing industry and the Seamen's Vocational Association, work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the German deep-sea fishery in 1961, the lugger herring fishery, the cutter deep-sea and coastal fisheries, fresh-water fisheries, processing of fish and shellfish, publicity campaign, and promotion of fish marketing. Part IV gives data on foreign fisheries and whaling.

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HORSE MACKEREL:

La Caballa del Mar Argentino, I--Sistematica, Distribucion y Pesca (The Horse Mackerel of the Argentine Sea, I--Description, Distribution, and Fishery), by Rogelio B. Lopez, 38 pp., illus., printed in Spanish. (Reprinted from Comunicaciones del Museo Argentino de Ciencias Naturales BERNARDINO RIVADAVIA e Instituto Nacional de Investigacion de las Ciencias Naturales, Ciencias Zoológicas, vol. 3, no. 3, 1959, pp. 95-130.) Ministerio de Educacion de la Nacion, Direccion General de Cultura, Buenos Aires, Argentina.

ICELAND:

Fjarmalatidindi, no. 3, August-December 1962, 247 pp., illus., printed in Icelandic. Fjarmalatidindi, Lansbalka Islands, Reykjavik, Iceland. Includes, among others, statistical tables giving data on production of fishery products.

INTERNATIONAL COMMISSIONS:

International North Pacific Fisheries Commission, Bulletin No. 8, 113 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B.C., Canada, 1962. Includes articles on "Intraspecific Differences in Serum Antigens of Red Salmon Demonstrated by Immunochemical Methods," by George J. Ridgway, George W. Klontz, and Charles Matsumoto; and "Continental Origin of Red Salmon as Determined from Morphological Characters," by Francis M. Fukuhara and others.

(International North Pacific Fisheries Commission)
The Exploitation, Scientific Investigation and Management of Salmon (Genus ONCORHYNCHUS) Stocks on the Pacific Coast of Canada in Relation to the Abstention Provisions of the North Pacific Fisheries Convention, Bulletin No. 9, 120 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B.C., Canada, 1962. Under the provisions of the International Convention for the High Seas Fisheries of the North Pacific Ocean, Japan and, in one instance, Canada agree to abstain from fishing Pacific salmon (genus *Oncorhynchus*) in portions of the Convention area off the coasts of Canada and the United States. The Commission is required to study the stocks of fish under abstention for the purpose of determining annually whether such stocks continue to qualify for abstention. The purpose of the papers contained in this bulletin was to provide information which would aid the Commission to carry out the above duty, that is to determine annually, beginning in 1958, whether the salmon stocks originating in the rivers of Canada continued to meet the requirements for abstention given in the Convention.

INTERNATIONAL FISHERIES CONVENTION:

International Fisheries Convention of 1946, The Permanent Commission, Report by the President on the Tenth Meeting, 29 pp., processed in French and English. Office of the Permanent Commission, Rm. 617, East Block, Whitehall Pl., London SW1, England, 1962. Includes a report by the President on the Tenth Meeting of the Permanent Commission, held in Hamburg, May 1962; a list of names and descriptions of delegates, advisors, and observers attending the meeting; and the agenda. Also presents a report by the

Finance Committee in regard to the financial year ended June 30, 1961, and estimate of payments and receipts for the year ending June 30, 1962; provisional budget for the year ending June 30, 1963; and a press notice issued after the Tenth Meeting.

IRRADIATION PRESERVATION:

"Progress in Food Irradiation," by M. Ingram and D. N. Rhodes (Low Temperature Research Station, Cambridge, England), article, Food Manufacture, vol. 37, July 1962, pp. 318-320, 323-326, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

ISRAEL:

Bamidgeh (Bulletin of Fish Culture in Israel), vol. 14, no. 3, September 1962, 42 pp., illus., printed in Hebrew and English. Fisheries Division and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel. Contains, among others, articles on: "An Exposition of the Terms 'Pond Productivity' and 'Carrying Capacity' of Ponds," by S. Tal; and "Primary Production in Fishponds and Its Application to Fertilization Experiments," by B. Hefher.

JAPAN:

Japan's Licensing and Exchange Controls, by Tatsuo A. Miyakawa, OBR-62-6, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on Japan's import and export controls and United States controls on exports and imports.

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 11, no. 1, September 1962, 109 pp., illus., printed in Japanese with English abstracts. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Includes, among others, these articles: "Studies on the Catch Efficiency Derived from the Difference in the Construction of Tuna Long-Line Gear. III--On the Results of the Test Operations by the Long-Line Gear with 2-5 Hooks," by Tomokazu Morita and Nobuo Higo; "Notes on Some Marine Algae from Viet-Nam. I" (in English), by Takeshi Tanaka and Pham-Hoang Ho; "On the Deterioration of Frozen Fishes during Storage," by Jun-ichi Nishimoto; and "Studies on the Tannage of Fish Skin," by Michitoshi Ochi.

KING CRABS:

Loss of Isthmus Tags from King Crabs (PARALIT-HODES CAMTSCHATICA) (Tilesius) (Final Report), by George W. Gray, Jr., Informational Leaflet No. 22, 5 pp., illus., processed. Alaska Department of Fish and Game, Support Bldg., Juneau, Alaska. Discusses the discrepancies in percentages of tag losses found by various observers. An experiment was conducted in which tagged king crab were retained in a tank of sea water, fed, and observed for tag losses. Findings showed that with proper methods and materials the loss of isthmus tags immediately prior to molting is negligible.

KOREA:

Agriculture Year Book, 1962, 512 pp., illus., printed in Korean with English tables. The National Agricultural Co-Operatives Federation, Seoul, Korea. Includes,

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among others, statistical tables on tonnage of fishing vessels, production of marine products, fishery population, products of aquatic culture, processed marine products, and foreign trade in marine products.

LIPID DEPRESSANT:

"The Lipid Depressant Activities of Whole Fish and Their Component Oils," by James J. Peifer, F. Janssen, R. Muesing, and W. O. Lundberg (The Hormel Institute, University of Minnesota, Austin), article, Journal of the American Oil Chemists' Society, vol. 39, June 1962, pp. 292-296, printed, American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

LOBSTERS:

"Control of Blackening of Lobster," by Michinori Yamaga and others (Taiyo Fishery Co., Shimono-seki, Japan), article, Chemical Abstracts, vol. 56, April 2, 1962, 7758e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

The Food of the Norway Lobster, NEPHROPS NORVEGICUS (L.), by H. J. Thomas and C. Davidson, Marine Research 1962, No. 3, printed, \$1.10. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., April 1962.

LOUISIANA:

"A Study of the Fauna of the Offshore Waters in Louisiana," by C. E. Dawson, article, Proceedings of the First National Coastal and Shallow Water Research Conference, October 1961, pp. 445-446, printed, Gulf Coast Research Laboratory, Ocean Springs, Miss.

LUMINESCENCE:

"Comparative Studies of Luminescence in Copepods and Other Pelagic Marine Animals, by G. L. Clarke and others, article, Journal of the Marine Biological Association of the United Kingdom, vol. 42, no. 3, October 1962, pp. 541-564, illus., printed, 70s. (about US\$13). Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

MALAGASY REPUBLIC:

"Evolution de la Pisciculture et de la Pêche dans les eaux intérieures de Madagascar depuis 1950" (Development of Fish Culture and the Inland Waters Fishery of Madagascar since 1950), by A. Kiener, article, Bulletin de Madagascar, vol. 12, no. 199, December 1962, pp. 1033-1044, illus., printed in French. Bulletin de Madagascar, M. le Directeur de l'Imprimerie nationale, Tananarive, Malagasy Republic.

MALAYA FEDERATION:

"Weight Increase in Toddler Children in the Federation of Malaya: A Comparison of Dietary Supplements of Skim Milk and Fish Biscuits," by Florence A. Thomson and Elizabeth Merry (Institute for Medical Research, Kuala Lumpur, Federation of Malaya), article, British Journal of Nutrition, vol. 16, no. 2, 1962, pp. 175-183, printed, Cambridge University Press, 200 Euston Rd., London NW1, England.

MEXICO:

Economic Developments in Mexico, 1961, by Katherine E. Rice, WTIS Part 1, Economic Report No. 62-79, 16 pp., printed, 15 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Includes a review of 1961, relations between Mexico and the United States and between Mexico and other countries, finance, changes in tariffs and trade controls, economic development program, and investment climate. Also covers economic trends, manufacturing and extractive industries, electric power, agricultural production and distribution, and farm programs. A section on fisheries discusses shrimp landings and exports, total value of fishery products exports and imports, edible fishery products landings, and the more important commercial species.

MISSISSIPPI:

"Report on the Gulf Coast Research Laboratory, 1955-1960," by G. Gunter, article, Journal of the Mississippi Academy of Science, vol. 7, 1961, pp. 22-28, printed, Gulf Coast Research Laboratory, Ocean Springs, Miss.

MOLLUSKS:

Shells of the New York City Area: A Handbook of the Land, Fresh Water and Marine Mollusks Ranging from Cape Cod to Cape May, by Morris K. Jacobson and William K. Emerson, 142 pp., illus., printed, Argonaut Books, Larchmont, N. Y., 1961.

NETS:

How to Make and Set Nets; or, the Technology of Netting, by John Garner, 103 pp., illus., printed, Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England, 1962. A valuable reference for both the net maker and the fisherman who uses and operates the nets. The earlier chapters explain the basic technology of preparing the looms in order to make and shape the various nets with maximum efficiency and economy. The later chapters deal with the specific nets used by fishermen and give an understanding of the principles of operation and rigging by which they give best results. Discusses in detail, with the aid of many sketches, mesh size, net-making machines, loom planning, shaping netting, and hanging netting. Further discussions cover seine net patterns, trawls, pound nets, and surround nets. A dictionary of fishing gear and terminology is included.

"Prüfmethoden für Netzgarne und Netztuche" (Testing Methods for Net Twine and Webbing), by A. von Brandt, article, Protokolle zur Fischereitechnik, vol. 30, no. 7, 1960, 92 pp., illus., printed in German, Institut für Netz- und Materialforschung, Bundesforschungsanstalt für Fischerei, Palmallee 9, Hamburg-Altona 1, Germany.

NEW CALEDONIA:

"Thriving Fishermen's Co-Operative in Noumea," by Raymond Cassier, article, South Pacific Bulletin, vol. 12, no. 4, October 1962, pp. 29, 56, illus., printed,

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single copy 30 cents. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Established in mid-1960, the Fishermen's Co-Operative of Noumea has shown steady progress. In the first year, 48 tons of fish were sold, and production was doubled within 12 months. The Co-Operative receives the catch from the fishermen, deep-freezes it, and sells it on the Noumea market, either wholesale or retail. Assets include a freezing plant and 100-foot wharf.

NEW ENGLAND:

Terrestrial and Marine Mammals of Massachusetts and Other New England States, by Joseph H. Waters and C. Jean-Jacques Rivard, 157 pp., illus., printed. Standard-Modern Print Co., Brockton Mass., 1962.

NIGERIA:

Report on the Fisheries of Nigeria, by A. R. Longhurst, 53 pp., printed. Federal Fisheries Service, Ministry of Economic Development, Lagos, Nigeria, 1962. Sums up the fisheries situation in Nigeria and its future requirements. Only about one-fourth of Nigeria's fisheries products supplies are produced locally. The author believes that the best prospects for increasing production lie in the exploitation of distant-water fisheries, both pelagic (especially the tunas) and demersal. There is an account of the fresh-water fisheries, indicating scope for expansion in the potentially rich fisheries of Lake Chad. Research work conducted by the Federal Fisheries Service is described, including surveys made by the 70-foot research vessel, a study of the life histories of the most important species, and studies of mesh-selection and the fishing effort.

OCEANOGRAPHY:

Fisheries Hydrography. How Oceanography and Meteorology Can and Do Serve Fisheries, by Iimo Heila and Taivo Laevastu, 137 pp., illus., printed. Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England, 1961.

Fishes and Fish Larvae Collected from Atlantic Plankton Cruises of R. V. "Pathfinder," 1961/62, by William Henry Massmann, Special Scientific Report No. 33, no. 1, printed. Virginia Fisheries Laboratory, Gloucester Point, Va., 1962.

The Johns Hopkins Oceanographic Studies, No. 1, 68 pp., illus., printed. Johns Hopkins Press, Homewood, Baltimore 18, Md., 1962.

Journal du Conseil, vol. 27, no. 3, November 1962, pp. 219-335, illus., printed, single copy Kr. 16 (about US\$2.32). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. (Available from Messrs. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.) Includes, among others, articles on: "The Effect of Tidal Streams on the Presence of an Extensive Layer of Midwater Echo Traces," by V. Valdez and D. H. Cushing; "Asdic as an Aid to Spawning Ground Investigations," by A. R. Stubbs and R. G. G. Lawrie; "Measurement of the Dimensions of Fish to Facilitate Calculations of Echo-Strength in Acoustic Fish Detection," by R. W. G. Haslett; "The Correlation Table Analysis of a Sprat (*Clupea sprattus* L.) Year-Class to Separate Two Groups Differing in Growth

Characteristics," by T. D. Iles and P. O. Johnson; "The Use of the Scales of the Brown Trout (*Salmo trutta* L.) for the Back-Calculation of Growth," by Charlotte Kipling; "Some Observations on the Whiting (*Gadus merlangus* L.) of the Inshore Winter Fishery Off Lowestoft," by D. W. R. Rout; and "Transatlantic Migration of Two Large Bluefin Tuna," by Frank J. Mather III.

The Ocean, by Francis Downes Ommanney, No. 203, 244 pp., illus., printed, \$1.75. The Home University Library of Modern Knowledge, Oxford University, Amen House, Warwick Sq., London EC4, England, 1961.

Proceedings of the First National Coastal and Shallow Water Research Conference, October 1961, Baltimore, Maryland, Los Angeles, California, Tallahassee, Florida (Sponsored by The National Science Foundation and The Office of Naval Research), edited by D. S. Gorsline, 900 pp., illus., processed. Acting Director, Oceanographic Institute, Florida State University, Tallahassee, Fla., February 1962. Contains programs of the meetings held at Baltimore, Los Angeles, and Tallahassee, and abstracts of papers presented. Also includes the texts of all papers presented by American as well as foreign scientists.

OYSTERS:

Useful Publications for Oyster Farmers of the Maritimes, by J. C. Medcof, General Series Circular No. 32, October 1958, 3 pp., printed. Fisheries Research Board of Canada Biological Station, St. Andrews, N. B., Canada.

PAKISTAN:

Establishing a Business in Pakistan, by George S. Ayres, WTIS Part 1, Economic Report No. 62-44, 24 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report summarizing the major legal requirements for establishing a business and investing in Pakistan. Outlines the pertinent sections of Pakistan's laws, regulations, and policies affecting the establishment and operation of business enterprises in Pakistan by foreign nationals. Attention also has been given to the factors governing foreign participation in joint ventures with Pakistani nationals. Covers Government policy on investments, entry and repatriation of capital, trade factors affecting investment, and business organization. Also discusses patents, copyrights, and trademarks; regulations affecting employment; taxation; avoidance of double taxation; and miscellaneous overhead costs.

Pakistan's Licensing and Exchange Controls, by George S. Ayres, OBR-62-5, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Contains information on Pakistan's import policy--licensing controls, and exchange controls; Pakistan's export controls--administration and extent, and promotion plan; and United States controls on exports and imports, and other related topics.

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PERU:

Establishing a Business in Peru, by R. F. Rodriguez, WTIS Part 1, Economic Report No. 62-78, 32 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses in detail investment outlook, business organizations, business record, organization costs, taxation, labor legislation, and other related subjects.

PILCHARDS:

The Pilchard of South West Africa (SARDINOPS OCELLATA), General Hydrography of the Waters Off Walvis Bay, South West Africa, 1957-1958, by G. H. Stander, Investigational Report No. 5, 61 pp., illus., printed. Administration of South West Africa, Marine Research Laboratory, Windhoek, South West Africa, 1962. Figures for temperature, salinity, and sigma-T are considered on a monthly and a seasonal basis. The data obtained in respect to the dissolved inorganic phosphorus in the upper 50 meters of the sea are discussed. Brief reference is made to wind data collected at Pelican Point.

PORTUGAL:

"La industria portuguesa de conservas de pescado y los problemas de su reorganizacion" (The Portuguese Canned Fish Industry and Problems of Its Reorganization), by Mario de Sousa, article, Industria Conservera, vol. 28, no. 280, October 1962, pp. 253-254, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

PROTEIN:

"Post-mortem changes in Fish Tissues: Endogenous Proteinases in Codfish and Rockfish Kidney and Protein Degradation in Rockfish Skeletal Muscle," by Chesley M. Blackwood (University of Washington, Seattle), article, Chemical Abstracts, vol. 57, August 6, 1962, 3892b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

PURSE SEINING:

"Lov na svet koshel kovym nevodom s motodori" (Purse Seining with Lights from a Motorized Dory), by V. M. Kirillov, article, Rybnoe Khoziaistvo, vol. 37, no. 1, 1961, pp. 27-31, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"New Method of Purse Seining," by I. I. Kul'batskii, Rybnoe Khoziaistvo, vol. 36, 1960, pp. 46-48, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta pri Gosplanie SSSR, Moscow, U.S.S.R.

QUALITY:

"Frozen-Food Indicator Checks Product Quality," article, Food Engineering, vol. 34, February 1962, p. 100, printed. Chilton Company, Chestnut and 56th Sts., Philadelphia 36, Pa.

RADIATION PRESERVATION:

Radiation Preservation of Food, PB 151 493, 461 pp., printed, \$5. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., August 1957.

REFRIGERATED WAREHOUSES:

"Air Doors for Refrigerated Warehouses--a Review," article, Information Bulletin, The Refrigeration Research Foundation, No. 61-11, 1961, pp. 2-3, illus., printed. The Refrigeration Research Foundation, 12 N. Meade Ave., Colorado Springs, Colo.

REFRIGERATION:

"Problems and Progress in Retaining Fish Quality by Refrigeration--Paper 1," by Charles L. Cutting (British Food Manufacturing Industries Research Association, Randalls Road, Leatherhead, Surrey, England), article, Modern Refrigeration, vol. 65, May 1962, pp. 448-451, printed. Refrigeration Press Ltd., Maclaren House, 131 Great Suffolk St., London SE1, England.

"Refrigeration and Fish: Recent Developments in Cooling and Freezing," by J. R. Crepey, article, Genie Rural, vol. 55, no. 4, April 1962, pp. 203-205, 231, illus., printed in French. J. H. LaGrange, 39 Rue du General Foy, Paris 8e, France.

SALMON:

Salmon Forecast Studies on 1963 Runs in Prince William Sound, by Wallace A. Noerenberg, Informational Leaflet No. 21, 30 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, January 1, 1963. Discusses the value of salmon run forecasts to industry; methods used in obtaining data; and approximate numbers of pink, chum, and red salmon expected in the 1963 run. Also includes a number of detailed statistical tables and graphs giving data on commercial catches of salmon, 1920-61; escapement-return ratios; live counts of salmon in various areas; and other similar data.

SALT FISH:

Quantitative Characteristics of Fish after Salting, by L. P. Levanidov, Israel Program for Scientific Translations, PST Cat. No. 109, pp. 39-45, processed. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1960.

"Studies on Dry-Salting and Sundrying of Mackerel (Rastrelliger kanagurta Cuv.); "Effect of Chlortetracycline, Sorbic Acid, Sodium Propionate, Sodium Benzoate and Sodium Acid Phosphate on the Keeping Quality of Sun-Dried Salted Mackerel;" and "Effect of Varying Proportions of Salt to Fish on the Quality of Sun-Dried Mackerel," by D. P. Sen, K. Visweswariah, and N. L. Lahiry, articles, Food Science, vol. 10, 1961, pp. 123-131, 132-138, and 139-143, respectively, illus., printed. Central Food Technological Research Institute, Mysore, India.

SEAWEED:

"Chemical Studies on Volatile Constituents of Seaweed. XVIII--Analysis of the Volatile Constituents of Laminaria by Gas Chromatography," by Teruhisa Katayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, July 1961, pp. 703-709, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

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SHARKS:

"Cetorhinus" en Atlantico Sur, (Elasmobranchii: Cetorhinidae) (Cetorhinus in the South Atlantic--Elasmobranchii: Cetorhinidae), by Elvira M. Siccardi, 43 pp., illus., printed in Spanish with English summary. (Reprinted from Revista del Museo Argentino de Ciencias Naturales BERNARDINO RIVADAVIA e Instituto Nacional de Investigacion de las Ciencias Naturales, Ciencias Zoológicas, vol. 6, no. 2, 1961, pp. 59-101.) Ministerio de Educacion de la Nacion, Direccion General de Cultura, Buenos Aires, Argentina.

SHRIMP:

"Investigation of the Effect of Packaging Frozen Cooked Shrimp under Vacuum and in an Atmosphere of CO₂," by Olaf Karsti and Dagfinn Hakvag, article, Reports on Technological Research Concerning Norwegian Fish Industry, vol. 4, no. 1, 10 pp., printed in Norwegian with summary in English. Fiskeridirektoratet, Bergen, Norway, 1961.

"Microbial Analysis of Frozen Raw and Cooked Shrimp. I--General Results," by G. J. Silverman and others, article, Food Technology, vol. 15, 1961, pp. 455-458, illus., printed. Food Technology, The Garrard Press, 510 No. Hickory, Champaign, Ill.

"On the Qualitative Distribution of Amino Acids in Different Species of Prawns," by N. K. Velanker (Central Fisheries Technological Research Station, Ernakulam, South India) and K. Mahadeva Iyer, article, Journal of Scientific and Industrial Research, vol. 20C, no. 2, 1961, pp. 64-65, illus., printed. Council of Scientific and Industrial Research, Old Mill Rd., New Delhi 2, India.

"Studies on the Nutritive Value of Bombay Prawns. II--Chemical Composition and Nutritional Constituents of Penaeid Prawns," by F. S. Shaimkahmud (Department of Biochemistry, Institute of Science, Bombay, India) and N. G. Magar, article, Journal of Scientific and Industrial Research, vol. 20D, no. 4, 1961, pp. 157-158, printed. Council of Scientific and Industrial Research, Old Mill Rd., New Delhi 2, India.

"Undersøkelse over effekten av vakuumpakking og lagring i kullsyreatmosfaere ved frysing av reker" (Study of the Effect of Vacuum-Packing and Storage in Carbon Dioxide on Frozen Shrimp), by O. Karsti and D. Hakvag, article, Fiskeridirektoratets Skrifter, vol. 4, no. 1, 1961, pp. 3-10, illus., printed in Norwegian. Fiskeridirektoratets Skrifter, Fiskeridirektoratet, Bergen, Norway.

SMALL BUSINESS MANAGEMENT:

Growth: Implications for Small Marketers, by Albert Christopher, Small Marketers Aid No. 86, 4 pp., processed. Small Business Administration, Washington 25, D. C., December 1962. A leaflet to help small businessmen in their individual efforts to explore opportunities resulting from the Nation's expansion. At least six trends are on the increase in the country's growth. They are population, urban areas, productivity, automation, income, and leisure. Although growth is uneven and varies with localities, these trends are resulting in conditions that can help small marketers. The leaflet suggests ways by which the small retailer, wholesaler, or service operator can keep aware of the Nation's growth and its affects on his business.

SMOKING:

"Smoking of Foods. III--Mechanism of Smoking," by P. Spanyol (Central Research Institute of Food Industries, Budapest, Hungary) and E. Kevai, article, Zeitschrift für Lebensmittel-Untersuchung und -Forschung, vol. 115, 1961, pp. 1-9, printed in German. Zeitschrift für Lebensmittel-Untersuchung und -Forschung, Springer Verlag, 3 Heidelberger Platz, Wilmersdorf, Berlin, Germany.

SOUTH AFRICA REPUBLIC:

The South African Fishing Industry Handbook and Buyers' Guide, 1962/63, 251 pp., illus., printed, R4.20 (about US\$5.90). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, South Africa Republic, 1962. The sixth edition of this handbook reviews the progress of the South African and South-West African fishing industry during 1961 and 1962 and gives details of the catch and production of fishery products. Included is information on recent developments in the fishing industry; fish-processing factories; fish meal industry; South African fish species; legal minimum size limits of South African fish; and organizations serving the industry. Also covers leading personalities in the industry; South and South West African fishing companies; fishery products; buyers' guide; details of vessels; motor fishing boats; motor and steam trawlers; details of marine engines; and suppliers of fuels and lubricants.

SOUTHEAST ASIAN WATERS:

Physical Oceanography of the Southeast Asian Waters, NAGA Report Vol. 2--Scientific Results of Marine Investigations of the South China Sea and the Gulf of Thailand, 1959-61, by Klaus Wyrski, printed. Scripps Institute of Oceanography, La Jolla, Calif., 1961.

SOUTHEAST PACIFIC:

"Research on Marine Resources in Chile, Ecuador and Peru," by Robert Clarke (National Institute of Oceanography, England), article, Fishing News International, vol. 1, no. 5, October 1962, pp. 44-50, illus., printed, single copy 6s. 6d. (about 91 U.S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses the ocean currents along the Pacific Coast of South America and their relation to marine life; known marine resources such as the anchoveta, centolla, shrimp, tuna, whales, and seals; and present exploitation--fishing, guano harvesting, fishing methods, and whaling. Also covers future research and development, earlier research work, United Nations Special Fund fishery projects, and Ecuadorean and Peruvian research plans.

SPAIN:

"Las exportaciones de conservas de pescado gallegas en 1961" (Galician Exports of Canned Fish in 1961), by Manuel Ordax Ordax, article, Industria Conservera, vol. 28, no. 279, September 1962, pp. 222-224, 225, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

"La exportacion espanola de productos pesqueros. III--La exportacion de conservas de pescados y mariscos" (Spanish Export of Fishery Products. III--Export of Canned Fish and Shellfish), by V. Paz-Andrade, article, Industrias Pesqueras, vol. 36, no. 853, November 1962, pp. 370-372, printed in Spanish, single

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copy 10 ptas. (about 17 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2º, Vigo, Spain.

SPINY LOBSTERS:

Le rôle prépondérant des pêcheurs Cornouaillais dans la Recherche et l'Exploitation de nouveaux Fonds langoustiers (The Leading Role of the Fishermen of Cornouaillais in the Search and Exploitation of New Spiny Lobster Grounds), by E. Postel, 14 pp., illus., printed in French. (Reprinted from Penn Ar Bed, vol. 3, March 1962, pp. 141-152.) Office de la Recherche Scientifique et Technique Outre-Mer, Service Central de Documentation, 80, route d'Aulnay, Bondy (Seine), France.

SPONGES:

"Sponge Profits in a Squeeze," article, Chemical Week, vol. 91, no. 17, October 27, 1962, pp. 43-44, 46, 50, 55, illus., printed, single copy 50 cents. Chemical Week, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36, N. Y. Four different kinds of sponges are currently on U. S. markets: the natural sea-sponge, which is a marine animal's skeleton (generally, Phylum porifera), and three synthetics: cellulose, vinyl, and urethane. Natural sponges are harvested by local fishermen both in the Mediterranean and the Gulf of Mexico. In 1939 a severe sea blight off the Florida Keys decimated the U. S. crop--sending the synthetics into their first spurt of popularity. While the synthetics are most popular in household uses, natural sponges have greatest use by painters, janitors, artists, window-washers, and in industrial applications (printing, cleaning, painting, ceramics).

SQUID:

"Squid Tropomyosins," by Shuichiro Kubo, article, Memoirs of the Faculty of Fisheries Hokkaido University, vol. 9, no. 1, 1961, pp. 57-83, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

TAIWAN:

"Model Fishery Development in Taiwan," by E. Stuart Kirby, article, Fishing News International, vol. 1, no. 5, October 1962, pp. 16-20, illus., printed, single copy 6s. 6d. (about 91 U. S. cents). Fishing News International, Arthur J. Highway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Covers the fishery resources of Taiwan, fisheries administration and research, vocational and professional fisheries education, and fishermen's associations. Also discusses the types of fisheries--deep-sea, inshore, coastal, and fresh-water; fish processing; and marketing of fishery products.

Taiwan Fisheries, 1962, 59 pp., printed in Chinese and English. Taiwan Fisheries Bureau, Provincial Government of Taiwan, 1688 Chung Cheng Rd., Taipei, Taiwan. Covers in detail the four types of fisheries--deep-sea, inshore, coastal, and fish culture; fisheries production and value since 1931; fishing craft; fishing population and fishermen's associations; and harbors and fish production areas. Also discusses species of commercial importance; fish marketing and transportation; ice making, cold storage, and freezing; processing; education, training, and research; and foreign trade. Includes statistical tables on annual fisheries production, 1949-61, status of fishing craft, fishing population,

production by species, and foreign trade in fishery products.

TARPON:

"The Biology of the Tarpon, Megalops atlanticus, and the Ox-Eye, Megalops cyprinoides, with Emphasis on Larval Development," by Richard A. Wade, Contribution No. 424, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 12, no. 4, December 1962, pp. 545-622, illus., printed, single copy \$2. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

TAX GUIDE:

Tax Guide for Small Business, 1963 Edition, 143 pp., illus., printed, 40 cents. Internal Revenue Service, U. S. Treasury Department, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A handbook to assist individuals as well as firms in coping with their tax problems. The new tax guide answers most questions which arise in connection with starting, operating, or selling a business. Practical explanations and examples are provided to show how the Federal income, excise, social security, and withholding taxes apply to proprietorships, partnerships, and corporations. A tax calendar provides the dates for filing returns, paying taxes, and carrying out other operations under the Federal tax laws during 1963. A check list is helpful to the inexperienced in telling him what taxes he may be liable for and what forms he may be required to file. Also covered are the new rules under the Revenue Act of 1962, such as tax credit for investment in newly acquired equipment, extent to which expenses for business travel and entertainment may be deducted, and requirements for filing information returns for payments of dividends and interest.

TRADE LIST:

The U. S. Department of Commerce has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., or from Department of Commerce field offices at \$1 each.

Oils (Animal, Fish and Vegetable)--Importers, Dealers, Producers, Refiners, and Exporters, Republic of South Africa, 25 pp., processed (November 1962). Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish and whale oils.

TRAWLERS:

"Bulb-Trawlers," by D. J. Doust, article, Ship and Boat Builder, vol. 14, no. 6, 1961, pp. 40-42, illus., printed. Ship and Boat Builder, John Trundell Ltd., St. Richards House, Eversholt St., London NW1, England.

TRAWLING:

"O raznoglubinnom love seldi v Severnoi Atlantike" (On Midwater Trawling for Herring in the North Atlantic), by E. V. Kamenskii and V. R. Trebushnoi, article, Rybnoe Khoziaistvo, vol. 36, no. 11, 1960, pp. 42-49, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

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TRAWLS:

"Mechanical Analysis on the Working Behavior of Midwater Trawl," by Otohiko Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, October 1961, pp. 903-907, printed, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

TROUT:

"Fecondite et Croissance de la Truite (Salvelinus fontinalis) dans Trois Lacs du Parc des Laurentides" (Fertility and Growth of the Trout--Salvelinus fontinalis--in Three Lakes of Laurentides Park), by Yves Desmarais, article, Le Naturaliste Canadien, vol. 86, no. 2, February 1959, pp. 31-45, printed in French, Le Naturaliste Canadien, Université Laval, Quebec, Canada.

The Lake Trout--Its Life History, Ecology, and Management, by Russell Daly, Vernon A. Hacker, and Lawrence Wiegert, Publication No. 233, 15 pp., illus., printed, Wisconsin Conservation Department, Madison 1, Wis., 1962. Covers the classification, distribution, and description of the lake trout. Also describes its habits and habitat, reproduction, population size and mortality rates, and ecology. Angling and commercial fishing for lake trout, its economic value, and management are also described.

TUNA:

"Horizontal Distribution of Catch by the Longline," by Nobuo Hirayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, November 1961, pp. 987-989, printed, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

"Studies on the Tuna Longline Fishery in the Eastern China Sea and Okinawa Region. I--Fish Composition," by Ichiro Furukawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, June 1961, pp. 558-565, printed, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

UNITED KINGDOM:

Annual Abstract of Statistics, 1962, No. 99, 334 pp., printed, £1 2s. 6d. (about US\$3.15). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, 1962. Includes, among others, statistical tables giving data on the value and volume of fishery products landings and the composition of the British fishing fleet.

Licensing and Exchange Controls in the United Kingdom, by Thomas Brian Ketchum, OBR-62-1, 4 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) Discusses import and export controls of the United Kingdom and United States controls on imports from and exports to that country.

USE OF EXPLOSIVES:

"Seismic Splash," by William L. Craig, article, Outdoor California, vol. 23, no. 9, Sept.-Oct. 1962, pp. 18-20, illus., printed, California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif. The

use of explosives in the waters of California can be harmful to fish life. The author tells how the Department of Fish and Game and the Fish and Game Commission regulate the use of explosives in California to keep this loss to a minimum.

U.S.S.R.

"Fishing Craft of the USSR," by Alexander Gorinov, article, Fishing News International, vol. 1, no. 5, October 1962, pp. 80-82, illus., printed, single copy 6s. 6d. (about 91 U.S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The seven-year economic development plan of the Soviet Union (1959-65) provides for increasing the catch of fish, sea animals, and sea products from 2,900 million kilograms in 1958 to 4,640 million kilograms in 1965. New ships are being built and under the seven-year plan the fishing fleet will get more than 14,000 vessels. This article discusses the specifications and operations of some new floating factoryships, stern ramp trawlers, medium trawlers, motherships, and whaling vessels.

Freshwater Fishes of the U.S.S.R. and Adjacent Countries, by Leo S. Berg, Vol. 1, OTS 61-31218, 511 pp., illus., printed, \$5. (Translated from the Russian, Ryby presnykh vod SSSR i sopredel'nykh stran) Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C., 1962. Descriptions are given of all the fresh-water fish (including commercially-valuable species) of the Arctic Sea basins in Europe and Asia, the Pacific Ocean basin from the Bering Sea to the Tumen'-Ula River (on the Korean border), the basins of Lake Balkhash and the Aral Sea, the rivers of Turkmenistan, and the Black and Baltic Sea basins. Only some western European whitefish are excluded. The book can thus be used as a key for the identification of the fresh-water fish of almost all of Europe (except the Mediterranean countries) and North Asia, and covers an area larger than all of North America. Also included are descriptions of all the fish of the Caspian Sea, including those which do not enter fresh water.

Trudy nauchno-issledovatel'skogo instituta mehanizatsii rybnogo promysla VNIRO (Studies of the Scientific Research Institute of Mechanization of the Fishery Industry--VNIRO), 144 pp., illus., printed, 60 k. (about 70 U.S. cents). Four Continent Book Corp., 156 5th Ave., New York 10, N. Y.

"Utilization of Fish in the Soviet Union," by N. Voskresensky (Department of Technical Science, All-Union Institute of Scientific Research for Fisheries and Oceanography, Moscow, U.S.S.R.), article, Fishing News International, vol. 1, no. 5, October 1962, pp. 9-13, illus., printed, single copy 6s. 6d. (about 91 U.S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses the history and expansion of the Russian fishing industry, long-term plans for development, chilling and freezing of fish, methods of preparing canned fish, types of salted fish, production of caviar, and electrical smoking. According to the author, "In the programme adopted at the 22nd Congress of the Communist Party of the Soviet Union, the necessary basis has been laid down for rapid technical progress in the food industry in general and the fishing industry in particular."

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

VESSELS:

Merchant Vessels of the United States, 1962 (Including Yachts), 1183 pp., printed \$6.75. Bureau of Customs, U. S. Department of the Treasury, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers every American merchant vessel and yacht (including fishing vessels) which had an uncanceled document (register, enrollment and license, or license) on January 1, 1962. The official number, signal and radio-call letters, type of rig, name, tonnage, dimensions, place and date built, name of owner, and home port of every such vessel are provided.

WATER SAMPLER:

"A New Bottom-Water Sampler for Ecologists," by J. W. Murray, article, Journal of the Marine Biological Association of the United Kingdom, vol. 42, no. 3, October 1962, pp. 499-501, illus., printed, 76s. (about US\$13). Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

WHALES:

"Aerial Photographs Show Sperm Whales' Interesting Habits," by Masaharu Nishiwaki, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 10, October 1962, pp. 395-398, illus., printed, Norsk Hvalfangst-Tidende, Hvalfangerforeningen, Sandefjord, Norway.

"Whale of a Rendering Tale," article, National Provisioner, vol. 147, July 14, 1962, pp. 24-26, printed. National Provisioner Inc., 15 West Huron St., Chicago 10, Ill.

WHALING:

"The Tonnages of Whales Taken by Antarctic Pelagic Operations during Twenty Seasons and an Examination of the Blue Whale Unit," by D. T. Crisp, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 10, October 1962, pp. 389-393, printed. Norsk Hvalfangst-Tidende, Hvalfangerforeningen, Sandefjord, Norway. The number and tonnages of whales of each species taken by Antarctic pelagic whaling in the years 1932/33 to 1938/39 and 1946/47 to 1958/59 are shown in statistical tables and discussed in detail. The average number of whales taken was about 33,400 per season, but the average tonnage of whales taken per season fell from a pre-war total of about 2 million tons to a post-war total of 1½ million tons. The tonnage of baleen whale material taken each season is compared to the baleen oil production. The results suggest that the total tonnage of raw material in a catch is a useful means of estimating the production potential of that catch. One Blue Whale Unit consists of 80-100 tons of blue, fin or humpback material, but of about 130 tons of sei whale material. It is suggested that a realistic allowance for sei whales would be four individuals, about 87 tons, to one B. W. U.



FLORIDA'S ARTIFICIAL REEFS

Since "fish-drops" or artificial reefs have become productive, they have become more and more popular. There are some 20 established reefs or reefs being built on both coasts of Florida.

Interest in this "make-it-yourself" fishing has become so great that the State has set up rules and procedures for those interested in establishing a reef. After a site is chosen, application is made to the Internal Improvement Fund Trustees who in turn transmit their recommendation to the State Board of Conservation. The Board makes a survey of the proposed site. The Fund Trustees issue a permit if the findings are agreeable. Approval must also be obtained from the U.S. Corps of Engineers.

Latest findings show that a Japanese concrete block 8 feet long, 5 feet wide, and 2½ inches high, with two 15-inch holes on top and bottom and one on each side and one in either end, provide the best substance for artificial reefs. These can be planted about 24 inches apart or can be pyramided. It has been found that these blocks withstand the changing tides as well as storms and that their lasting qualities are better than anything else that has been used to date. Some have been observed in Japan for over 30 years with little signs of deterioration, also some have been in use in the waters of North Carolina for over 10 years. An estimated cost of this block is around \$20. Reports indicate that good sport fishing is found at almost all of the reefs that have been established.

SEA LAMPREYS A GOURMET'S DELIGHT IN SOME PARTS OF THE WORLD

The SEA LAMPREY, reviled generally in North America as an ugly, useless destroyer of other fish, has quite a good reputation in other parts of the world.

As an epicurean delight it is said to have been the unwitting cause of the demise of one monarch, King Henry I of England, who gorged himself to death on them. Later, Henry IV granted protection to ships carrying lampreys for the Royal Consort, and King John so prized them that he once gave a horse in exchange for a single lamprey.

These and other interesting aspects of various people's behavior toward the lamprey, all indicating that "beauty is in the eye of the beholder," formed an interesting report at the annual meeting of the Fisheries Research Board of Canada in 1961.

Most North American interest in the lampreys is generated by the efforts being made to control them in the upper Great Lakes, where they first established a beachhead when the Welland Canal allowed them to circumvent Niagara Falls. They preyed so heavily on lake trout that the latter were almost completely wiped out.

As a table delicacy, however, history as well as present-day gastronomes hold the lamprey in very high esteem. Lampreys, states the report, were formerly used by many North American Indian tribes as food, although some shunned them. During the Nineteenth and Twentieth centuries they were used widely as food by whites as well, particularly by inhabitants of the New England states, among whom it was the custom for families living near a lamprey river to salt down several barrels of lampreys for the winter. Less fortunate families living away from the lamprey rivers considered themselves fortunate when they could exchange a barrel of pork for a barrel of lampreys.

There is a record of one man taking several cartloads of lampreys daily from the St. Lawrence Dam in the Connecticut river in 1847, and around 1880 the going price for lampreys in that district was around five dollars a hundred.

Records of lamprey fisheries in Europe date back to the Romans who are said to have considered them a regal food. Today they are still held in high esteem by many European peoples who prepare them for their own use or carry on a thriving trade in them.

The report indicates that many little Dutch tykes, when not putting their fingers in holes in dikes, had another interesting occupation. Up to 1915 boats fishing out of Holland used to take about 2,000 lampreys aboard to use as bait for catching cod. Also aboard was a boy whose task it was to bite through the head of each lamprey, thus destroying the brain, paralyzing the lampreys, and making them easy to handle. (Canadian Fisherman, February 1962.)

AMERICA'S RARE SEA MAMMALS

Conservation Note 9, America's Rare Sea Mammals, describes how some of America's most interesting wildlife--seals, whales, and sea otters--were saved from extinction.

When America was discovered, many species of sea mammals were abundant in her waters. As early as 1614, whales were being hunted along the New England shores. By 1835, New England whaling vessels were traveling thousands of miles to reach whaling grounds in the North Pacific. At the same time, the sea otter and fur seals were rapidly being decimated along our Pacific coast.

The sea otter was once the world's most valuable fur animal. Formerly it ranged the coasts of the Pacific Ocean from the islands of Japan to Lower California. For 150 years following its discovery in Kamchatka in 1741, the sea otter was hunted relentlessly in American waters. By 1900 it was nearly extinct, remnants persisting in the wildest, most rugged places in the Aleutians and Alaska Peninsula, on the coast of Vancouver Island, and along the California coast. Only 34 skins were recorded for North America in 1910 and the United States Government closed the season on the species. Since 1911, the taking of sea otters in North America has been forbidden by international treaty.



Three adult sea otter and a pup on rocks.

The greatest need of the sea otter was protection from man. Protected, they began to increase and slowly spread from island to island in Alaska. Wildlife biologists say there may be 30,000 or 40,000 sea otters in Alaska today.

Very young sea otter pups have been seen in Alaska as early as March and as late as the end of August. The pup nurses until it is about a year old--lying on its mother's chest as she lazily paddles along with her broad hind flippers.

The northern fur seal has also been brought back from near extinction by a protective international treaty and careful land management. Now the rookeries in the Pribilof Islands fairly hum with activity each year in June as wave after wave of fur seals haul out on the beaches. An annual harvest of 60,000 to 70,000 fur seals valued at about \$5 million is taken each year by the United States Government.

Far to the south, along the Mexican and southern California coasts, a close relative of the northern fur seal has not fared so well. Killed by the thousands during the 1880's for its beautiful fur, by 1900 the Guadalupe fur seal was nearly gone from the islands along the California and Mexican coasts. For many years it was thought extinct, but in 1949 and again in 1951, lone bulls were seen near Saint Nicolas Island, California. Then in 1954 a group of 14 fur seals was found on Guadalupe Islands, Mexico. Possibly with careful management and protection the Guadalupe fur seal, too, may survive.

The position of the Hawaiian monk seal is also precarious. Monk seals are the only tropical-water seals in the world. In the 1,000-mile-long chain of islands in the Pacific on which it breeds--from Kure Island to French Frigate Shoals--the Hawaiian monk seal has been so reduced that it does not number more than 1,500 animals. With so few left, biologists fear the species will become extinct. Two factors endanger the monk seal; its extreme tameness and man's encroachment on its breeding islands.

Copies of Conservation Note 9 are available from the Office of Information, U. S. Fish and Wildlife Service, Washington 25, D.C.

SCALLOPS--A TREAT FOR LENT

Why not serve scallops during Lent as a special treat for your family?

Scallops are marketed all year but are at their best when taken from November through April. Scallops are a light cream color, sometimes varying to a delicate pink. Fresh scallops and frozen scallops when thawed, should have a sweetish odor.

Scallops have a lean, light, firm meat and a sweet flavor. They contain high levels of well-balanced protein, very little fat, and many of the minerals and vitamins necessary for the good health of all members of the family.



Scallops Lorraine.

In the past the most familiar scallop dishes served have been deep-fat fried or pan-fried scallops, however, these dishes are only a beginning since scallops can be served in cocktails, appetizers, soups, salads, and main dishes with equally satisfying results.

The home economists of the Bureau of Commercial Fisheries, United States Department of the Interior, recommend "Scallops Lorraine" as a special treat for the family during Lent.

SCALLOPS LORRAINE

1 pound scallops, fresh or frozen
1 quart boiling water
2 tablespoons salt
1 cup pastry mix
3 eggs, beaten
 $\frac{3}{4}$ cup coffee cream

2 tablespoons sherry
2 tablespoons chopped parsley
1 teaspoon salt
 $\frac{1}{2}$ teaspoon celery salt
Dash pepper
Paprika

Thaw frozen scallops. Remove any shell particles and wash. Place in boiling salted water. Cover and return to the boiling point. Simmer for 3 to 4 minutes, depending on size. Drain. Chop scallops. Prepare pastry mix as directed. Roll and line a 9-inch pie pan. Combine eggs and cream; add remaining ingredients except paprika. Place scallop mixture in pie shell. Sprinkle with paprika. Bake in a moderate oven, 350° F., for 35 to 40 minutes or until pie is firm in the center. Serves 6.

CALIFORNIA TELEPHONE CABLE AREA--CAREFUL PLEASE

The chart shows the telephone cables to be found in the waters off California. To avoid the loss of valuable tackle, cargo, other boards, nets, or anchor hooks, fishing vessels are urged to not dragnets or drop anchors or other heavy gear near the cable routes shown on the chart.

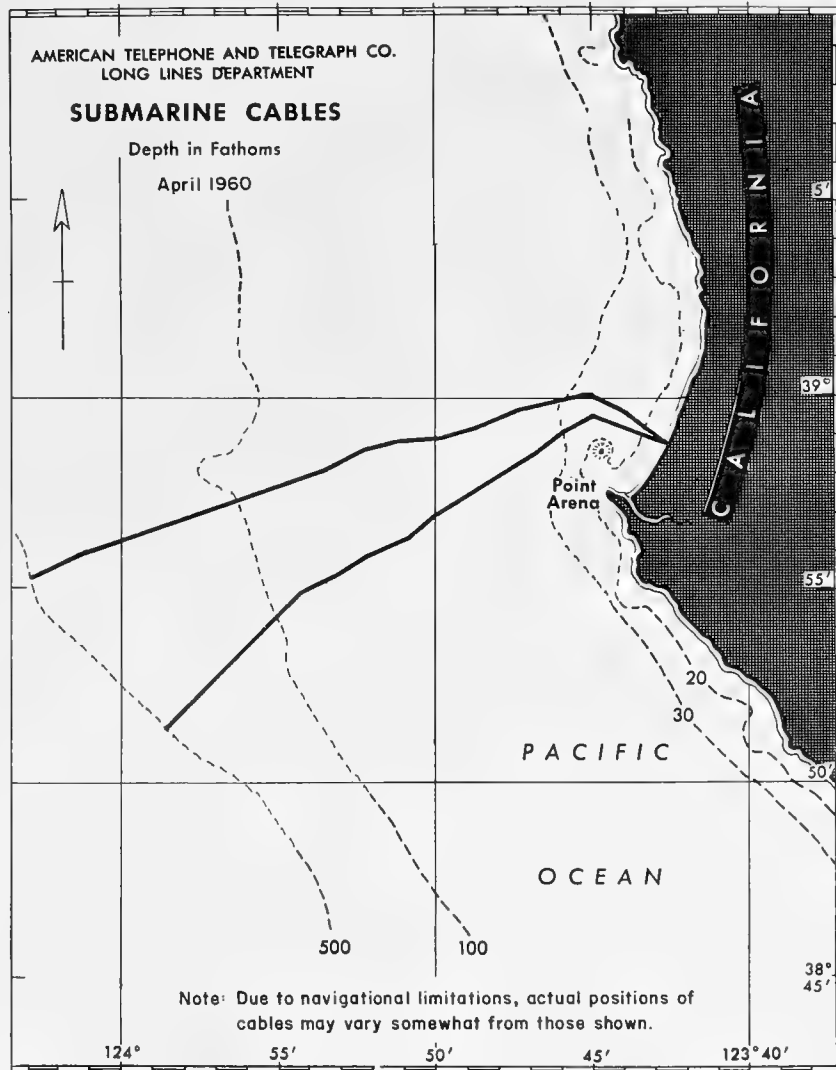
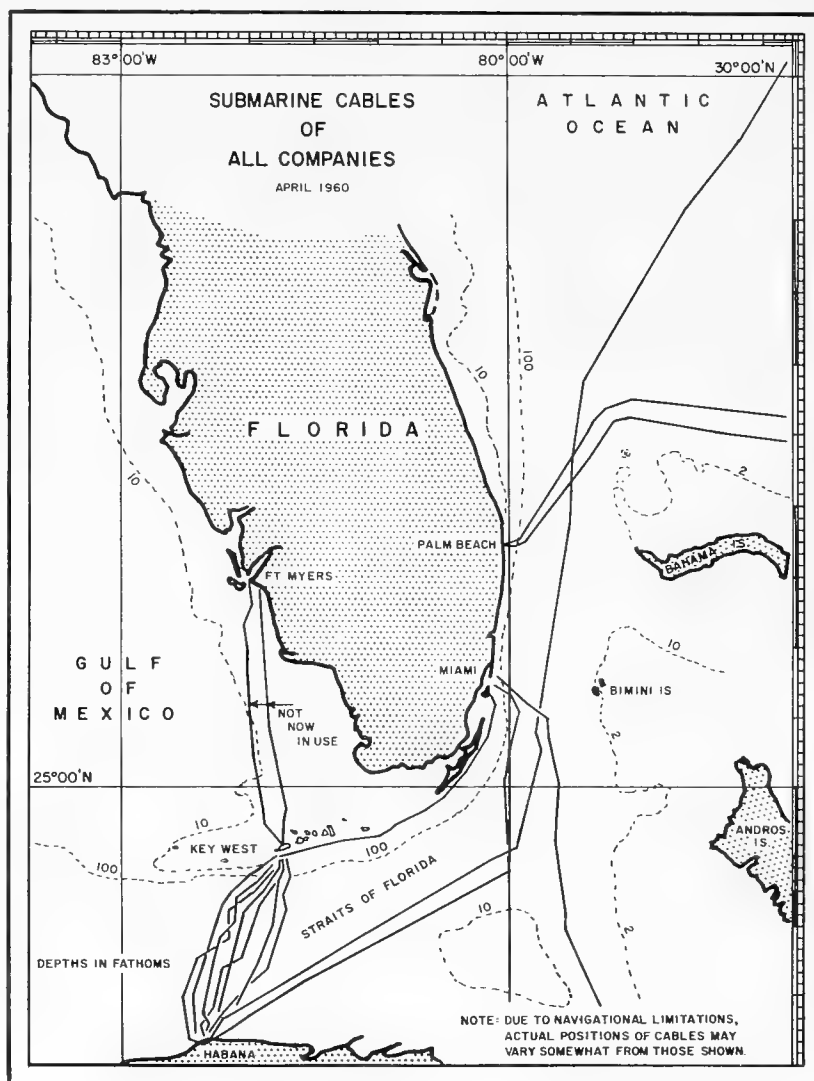


Chart showing the general location of the underseas cables are available from the American Telephone and Telegraph Company, General Manager, Special Projects Area, 32 Ave. of the Americas, New York 13, N. Y.

FLORIDA TELEPHONE CABLE AREA--CAREFUL PLEASE

The chart shows the telephone cables to be found in the waters off Florida. To avoid the loss of valuable tackle, cargo, otter boards, nets, or anchor hooks, fishing vessels are urged to not drag nets or drop anchors or other heavy gear near the cable routes shown on the chart. Avoid starting your trawling runs so that you cross these underseas telephone cables.



Charts showing the general location of the underseas cables are available from the American Telephone and Telegraph Company, General Manager, Special Projects Area, 32 Ave. of the Americas, New York 13, N. Y.

FEDERAL RESEARCHERS TAKE RARE "COW" SHARK

A one-ton fish with the unlikely name of "cow shark" has been landed off the Mississippi Delta by the Fish and Wildlife Service exploratory vessel Oregon, the Department of the Interior reported on January 15, 1963. The catch marks the first time a cow shark has been taken in the Gulf of Mexico, and the first one seen off North America in more than 75 years.

The 13-foot beast was picked up in a shrimp trawl about 40 miles southeast of the mouth of the Mississippi River at a depth of approximately 1,300 feet. Measurements and photographs were taken and these along with the shark's jaws and tail will be placed in the scientific collections at the National Museum in Washington, D. C. The shark's scientific name is Hexanchus griseus.

Most species of shark have five gill clefts on each side but this shark's scientific name Hexanchus literally means six-gilled. The presence of six gill openings on each side and the dissimilarity between its upper and lower teeth are identifying characteristics of this species. They are called cow sharks because they are large, slow moving, and not streamlined.

Cow sharks are known to eat small fish, squid, and other marine animals. They are not classed as man eaters.

The only other record of the occurrence of a cow shark on the east coast of continental North America was in 1886 near Currituck Lighthouse, North Carolina. According to the Fish and Wildlife Service's Bureau of Commercial Fisheries, this species of shark is probably more common than the records indicate, but it is not often seen or captured because it usually inhabits deeper waters.

Little is known about the occurrence and life of the cow shark in western hemisphere waters, and considerable research is needed on this and many other deep-water species that inhabit the Caribbean Sea and Gulf of Mexico.

The new record was an "extra dividend" of exploratory trawls the Oregon has been making to determine if commercial quantities of royal red shrimp can be taken in the Gulf during all seasons of the year. The shrimp exploration thus far indicates that commercial quantities of these deep-water shrimp are present in the fall.



Thirteen-foot cow shark caught by exploratory vessel, Oregon, in the Gulf of Mexico.

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Fishes

ROBERT H GIBBS JR

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor*
G. A. Albano,** H. M. Bearse, and H. Beasley, Assistant Editors

(*On special assignment for 7 months. **Acting Editor)

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington 5, D.C.

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5/31/63

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OYSTER FAMILY TREE

Oysters in Louisiana can be found breeding from April until October and in isolated cases even during the winter months. This is why the breeding oysters are called "milky" because of the milky looking fluid they exude at that time.

The milk of the female is composed of millions of minute eggs; that of the male of an incalculable number of extremely minute spermatozoa. A large female has been estimated to contain 60 million eggs. This milk is cast out into the water where the sperm of the male drifts or swims to the egg and penetrates it. This act of fertilization begins the cycle of oyster life. After fertilization takes place the egg divides again and again forming a ball of many tiny cells. In the course of a few hours, small vibrating hairs called "cilia" appear on the developing young oyster. With these cilia it keeps itself suspended while being drifted about by the winds and currents. Presently this embryo develops a pair of tiny shells. These shells grow larger and heavier and finally the young oyster in this stage drops to the bottom and attaches itself to some hard object and gives up forever its own power of moving from place to place.

The young oyster can only attach itself to a clean surface, and after attachment while very small it is easily smothered by sediment and dies. This is why oystermen first lay beds of oyster shells as a foundation before planting the seed oysters. (Louisiana Conservationist, September-October 1962, Louisiana Wild Life and Fisheries Commission.)



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STORAGE LIFE OF INDIVIDUALLY FROZEN PACIFIC OYSTER MEATS GLAZED WITH PLAIN WATER OR WITH SOLUTIONS OF ASCORBIC ACID OR CORN SYRUP SOLIDS^{1/}

By Richard W. Nelson*

ABSTRACT

Pacific oyster meats frozen by conventional methods adhere together as a block. If the oysters could be separated individually without prior thawing, the convenience of the product would be greatly improved. Experiments were conducted to determine if freezing oysters individually, glazing them, bulk packaging them in bags, and storing the bags in cartons at 0° F. would produce individually separable oysters with a satisfactory storage life. As part of the experiment, three groups of individually frozen oysters were glazed respectively with (1) plain water, (2) a solution of corn syrup solids, and (3) a solution of ascorbic acid in water in order to test whether such glazes would increase the resistance of the individually frozen oysters to rancidity.

INTRODUCTION

Often, for both the retail and the institutional trades, Pacific oysters (*Crassostrea gigas*) are frozen in hermetically sealed cans. The result is a frozen block of oyster meats in each can. Thus, before the oysters can be used, the entire contents of the can must be thawed so that the oysters can be separated. Thawing the oysters takes time. Furthermore, the thawed product must be used immediately.

If frozen oysters were processed in such a manner that they could be removed singly from the package while still frozen, the convenience of the product would be greatly improved.

Attempting to produce such a product raised a number of questions: How should the oysters be frozen? Should they be glazed? If so, what kind of a glaze should be used? How should the product be packaged?

Several investigators have studied methods of freezing oysters individually. Schwartz and Watts 1959, found that individually frozen oysters (*Crassostrea virginica*) from the Gulf of Mexico glazed with a 0.5-percent or a 1.0-percent solution of ascorbic acid had unsatisfactory storage life due to the development of rancidity. Fieger, Novak, and Bailey



Fig. 1 - Packaging individually frozen ice-glazed Pacific oysters.

*Chemical Engineer, Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

^{1/}This research was financed in part by funds from The Refrigeration Research Foundation.

1959, and Schwartz and Watts^{2/} again using oysters from the Gulf of Mexico found the immersion freezing did not improve the quality of the frozen oysters. Studies at the Seattle Technological Laboratory, Dassow and Nelson 1959, in which Pacific oysters (*Crassostrea gigas*) were frozen by immersion in sodium chloride brine and in sodium chloride brine with corn syrup solids added showed that Pacific oysters could not be frozen satisfactorily in that manner.

Blast freezing at the commonly used temperature of -20° F. appeared to be the simplest method of freezing. From experience with such other products as salmon and halibut, it also appeared that glazing would probably add significantly to storage life by reducing rancidity. Experience further indicated that adding ascorbic acid (Tarr 1946 and 1947) or corn syrup solids (Dassow and Nelson 1959) to the glaze might provide added protection against rancidity.



Fig. 2 - Individually frozen ice-glazed Pacific oysters packed in a polyethylene bag.

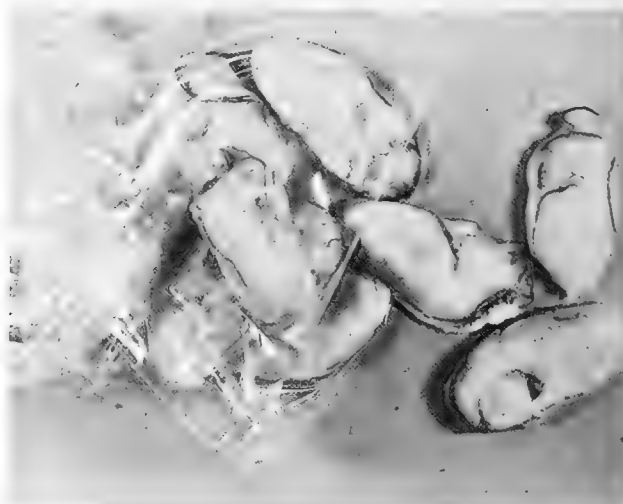


Fig. 3 - Package of individually frozen ice-glazed Pacific oysters opened for examination.

Packaging the oysters in bags made of a plastic, such as polyethylene, and holding the bags of oysters in fiberboard cartons in storage at 0° F. appealed to the investigators as a convenient way of packing and storing. That method would simplify processing and reduce production costs if plain water could be used in the glaze or if the glaze could be omitted altogether.

The objectives of the experiments described in this report therefore were to determine:

1. If freezing oysters individually in a blast freezer at -20° F., ice-glazing them, bulk-packaging them in polyethylene bags, and then storing the bags in fiberboard cartons at 0° F. would result in individually separable oysters with a satisfactory storage life.
2. If glazing is necessary.
3. If so, whether a glaze made from a solution of ascorbic acid or of corn syrup solids would add significantly to the storage life as compared with a glaze made from plain ice.

EXPERIMENTAL

Fresh shucked Pacific oysters (*Crassostrea gigas*) were placed on metal trays individually and frozen at -20° F. in a blast freezer for 15 minutes. After the oysters were frozen, they were divided into four groups: (1) control (packaged without further treatment), (2) glazed with water, (3) glazed with a solution containing 2-percent corn syrup solids, and (4) glazed with a solution containing 1-percent ascorbic acid. Glazing was accomplished by dipping the frozen oysters twice, for 10 seconds each time, in the glazing solution, which previously had been cooled to about 33° F. The controls and the glazed oysters were bulk-

^{2/}Schwartz, Mark G., and Watts, Betty M. "Freezing Preservation of Raw Oysters and Oyster Stews." Unpublished report in Bureau of Commercial Fisheries files.

packaged in polyethylene bags (figs. 1 and 2), and then packed into fiberboard cartons and stored at 0° F.

The samples were examined at intervals of 2 months. Criteria used for judging the quality of the oysters were color, odor, general appearance, and flavor.

RESULTS

After 2 months at 0° F., the oysters that were not protected with a glaze began to show deterioration (see table). After 4 months, they exhibited definite effects of oxidative change in that they had a very slight rancid odor and were slightly dark on the surfaces. They now were considered to be on the borderline of acceptability. After 6 months, they showed yellow discoloration, had a rancid odor, and were unacceptable.

All of the glazed oysters retained their original quality up to 4 months of storage. After 6 months, a minor loss of ice glaze was apparent on the edges of the oysters, especially a-

Results of Examinations of Individually Blast-Frozen, Glazed Pacific Oysters Stored at 0° F.												
Storage Period Months	None (Control)			Type of Glaze								
	Color	Odor	Remarks	Ice			1-Percent Ascorbic Acid			2-Percent Corn Syrup Solids		
				Color	Odor	Remarks	Color	Odor	Remarks	Color	Odor	Remarks
2	Normal	Normal	Fair appearance; slight dehydration	Normal	Normal	Very good appearance	Normal	Normal	Very good appearance	Normal	Normal	Very good appearance
4	Slight darkening of oyster surfaces	Very slightly rancid	Poor to fair appearance; borderline acceptability	Normal	Normal	Good appearance	Normal	Normal	Good appearance	Normal	Normal	Very good appearance
6	Moderate yellow discoloration and darkening	Slightly rancid	Poor appearance; unacceptable	A few areas slightly discolored	Normal	Slight loss of glaze in a few areas; good appearance otherwise	A few areas slightly discolored	Normal	Slight loss of glaze in a few areas; good appearance otherwise	A few areas slightly discolored	Normal	Slight loss of glaze in a few areas; good appearance otherwise
8	Entire surface dark yellow discoloration	Rancid	Inedible	A few areas slightly discolored	Normal	Slight loss of glaze; good appearance otherwise	A few areas slightly discolored	Normal	Slight loss of glaze; good appearance otherwise	A few areas slightly discolored	Normal	Slight loss of glaze; good appearance otherwise
10	Entire surface dark yellow discoloration	Extremely rancid	Inedible	A few areas of yellow discoloration	Normal	Slight loss of glaze; fair to good appearance; borderline acceptability	A few areas of yellow discoloration	Normal	Slight loss of glaze; fair to good appearance; borderline acceptability	A few areas of yellow discoloration	Normal	Slight loss of glaze; fair to good appearance; borderline acceptability

long the mantle. Very slight discoloration was noted in those areas. The odor of the oysters was normal. No differences in the condition of any of the glazed oysters were apparent except that, in general, the oysters glazed with the solution containing 2-percent corn syrup solids had a slightly lighter color. After 8 months, the glazed oysters still were normal in odor and of good appearance. The slight discoloration and loss of ice glaze, however, was more apparent than at the 6-months examination. After 10 months, the sublimation of ice glaze and the development of discoloration were more noticeable and caused the samples to be rated at the limit of acceptability. Cooked oyster samples had very good flavor except in the discolored areas, which tasted slightly rancid.

DISCUSSION

In previous work, we found that frozen Pacific oysters packaged in hermetically sealed cans had a storage life of approximately 8 months at 0° F. (Osterhaug and Nelson 1957). The

oysters in the present test compared favorably in storage life to those frozen in the cans.

The major advantages of freezing the oysters individually are that (1) they can be removed singly from the container (fig. 3), (2) they thaw rapidly, and (3) they retain their natural shape and, when packed in transparent containers, look attractive (figs. 2 and 3).

The major disadvantages of freezing oysters individually are: (1) they must be held at freezing temperatures at all times, for if they are allowed to warm above freezing, they thaw around the edges and, if the temperature again falls sufficiently, refreeze in a mass; (2) considerable weight (about 10 percent) is added in glazing; and (3) they require more freezer space because the individual oysters do not pack tightly together. The author believes, however, that for many purposes, the advantages outweigh the disadvantages.

Adaptation of commercial methods to the production of individually frozen oysters would be fairly simple. A blast freezer, plate freezer, or tunnel freezer could be used for freezing. A metal mold such as a tray with oblong depressions stamped in it could best be used for freezing. Use of this tray would permit two rounded sides in the frozen product.

CONCLUSIONS

1. Freezing oysters individually in a blast freezer at -20° F., ice-glazing them, bulk-packaging them in polyethylene bags, and storing the bags in fiberboard cartons at 0° F. produced individually separable oysters having a frozen storage life of about 8 months.

2. Glazing was necessary to protect the product, as unglazed controls had a storage life of not longer than 4 months.

3. There was no marked difference in storage life whether the glaze was made from water only, from a solution of 1-percent ascorbic acid, or from a solution of 2-percent corn syrup solids.

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FLUCTUATIONS IN MAINE SHRIMP LANDINGS

By Robert L. Dow*

Off the New England coast, catches of the northern shrimp (*Pandulus borealis*) are made during the winter on spawning areas within a 50-mile radius of Boothbay Harbor, Maine, by small draggers operating from nearby ports. Landings have fluctuated widely from year to year and appear to be related to abundance. No shrimp were caught from 1954 through 1957. During the peak season of 1944/1945 more than one-half million pounds were landed.



Fig. 1 - Sorting out northern shrimp caught off the Maine coast.

Abundance, in turn, appears to be related to seawater temperature, especially during the peak of spawning when shrimp are sufficiently concentrated to be of commercial interest. Analyses of temperature and catch data support this assumption.

March is the principal fishing month and accounts for nearly 65 percent of the landings during the 23 seasons of record.

*Research Director, Maine Department of Sea and Shore Fisheries, Augusta, Maine.

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Rasmussen (1953) found that mature females of this species from the Oslo Fjord ranged from 24 to 28 months of age when they were about 4 inches in length. Maine fishermen generally keep only mature females averaging 4 inches or more in length.

Since both Maine and southern Norway are near the southern limit of the range, it is assumed that the shrimp taken in the Maine fishery are approximately two years of age.

The table shows the relation between March seawater temperature as measured at Boothbay Harbor and Maine shrimp landings two years later. These data suggest a favorable temperature range of 34° F. to 36° F. with declines in landings when temperatures are above or below that range.

Relation Between March Seawater Temperature at Boothbay Harbor and Maine Shrimp Landings Two Years Later		
Mean March Seawater Temperature at Boothbay Harbor °F.	Average Shrimp Landings Two Years Later 1,000 Lbs.	Number of Years
32	45	3
34.5	235	5
36	275	3
37	50	3
38	45	3
39.5	10	4
41	0	2

If the assumption that a causal relationship exists between seawater temperature and shrimp abundance is valid, Maine landings should continue at a relatively high level through the 1964 fishing season. In March 1961 the seawater temperature was 36.5° F. In March 1962 the seawater temperature was 35.2° F.



Fig. 2 - A basketful of northern shrimp. This is a winter fishery.

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REVIEW OF THE 1962 SEASONAL MOVEMENT OF ALBACORE TUNA OFF THE PACIFIC COAST OF THE UNITED STATES

By Glenn A. Flittner*

ABSTRACT

Review of the 1962 seasonal movement of albacore tuna (*Thunnus* *germo*) off the Pacific Coast of the United States as revealed by U. S. Navy picket vessels monitoring fixed, continuously manned stations. Onshore and northward migration of albacore is related to rapid changes in corresponding 15-day sea surface temperature charts. Onset, termination of fishing at each station is reported, and relation to "optimum" sea temperatures is discussed. A schematic model of seasonal albacore movement of the Pacific Coast as suggested by 1960-62 catch data is presented.

BACKGROUND

As in the years since 1956, the U. S. Navy has continued its operation of the radar early warning surveillance network off the west coast of the United States. Coverage in 1962 extended from latitudes 31° N. to 50° N. at a distance from 200-500 miles from shore. A fleet of several vessels participated in the continuous-rotation schedule which required most ships to visit each station during the year for 20-30 day intervals.

In 1962 the joint U. S. Navy-U. S. Bureau of Commercial Fisheries cooperative picket vessel trolling program completed its third and most successful year. A total of 724 albacore was landed by the picket fleet. A large measure of the success can be attributed to the high degree of participation by picket vessel crew members. Recreational opportunities at sea are limited, and the fishing program has filled a vital need. The Bureau supplies each vessel with a kit of fishing gear and measuring board. Each kit contains several sets of trolling rigs made up of a 30-fathom line, shock-cord assembly, and standard commercial feather jig. All vessels troll with lines lashed to the stern rail, maintaining about 3-4 knots of steerage-way while steaming on station. A few catches were made by ships making speeds up to 8 knots.

As in previous years, the picket vessels commenced fishing on May 1 and terminated on November 1, the close of an average season. Late-season catches were made by the vessel Locator on November 1 and 7-10 inclusive.

RESULTS

The first catch of the 1962 season was reported by the U. S. S. Koiner at station 5 on June 11 (table 1). Fishing subsequently continued at this station well into July with few interruptions. Water temperatures ranged from 59°-60° F. at the beginning of fishing activity and rose to 64°-66° F. at the end. Albacore appeared at station 4 one week later (June 17), and at station 3 twenty-five days later (July 6). Station 2 reported the first albacore on August 7, whereas station 1 logged the first catch of the year on August 6. Fishing at station 6 was conducted on an intermittent basis; consequently, the date of earliest albacore catch does not necessarily represent the date of arrival of the first migrants.

*Fishery Biologist (Research), Biological Laboratory, U. S. Bureau of Commercial Fisheries, San Diego, Calif.

Station Number	Approximate Position		Date of First Catch	Water Temp. (°F.)
	Latitude	Longitude		
1	50° N.	134° W.	August 6	62
2	45° N.	135° W.	August 7	63
3	42° N.	129° W.	July 6	59
4	40° N.	133° W.	June 17	59
5	35° N.	132° W.	June 11	59
6 ^{1/}	30° N.	128° W.	July 19	64

^{1/}Fishing on intermittent basis - not continuous in early season.

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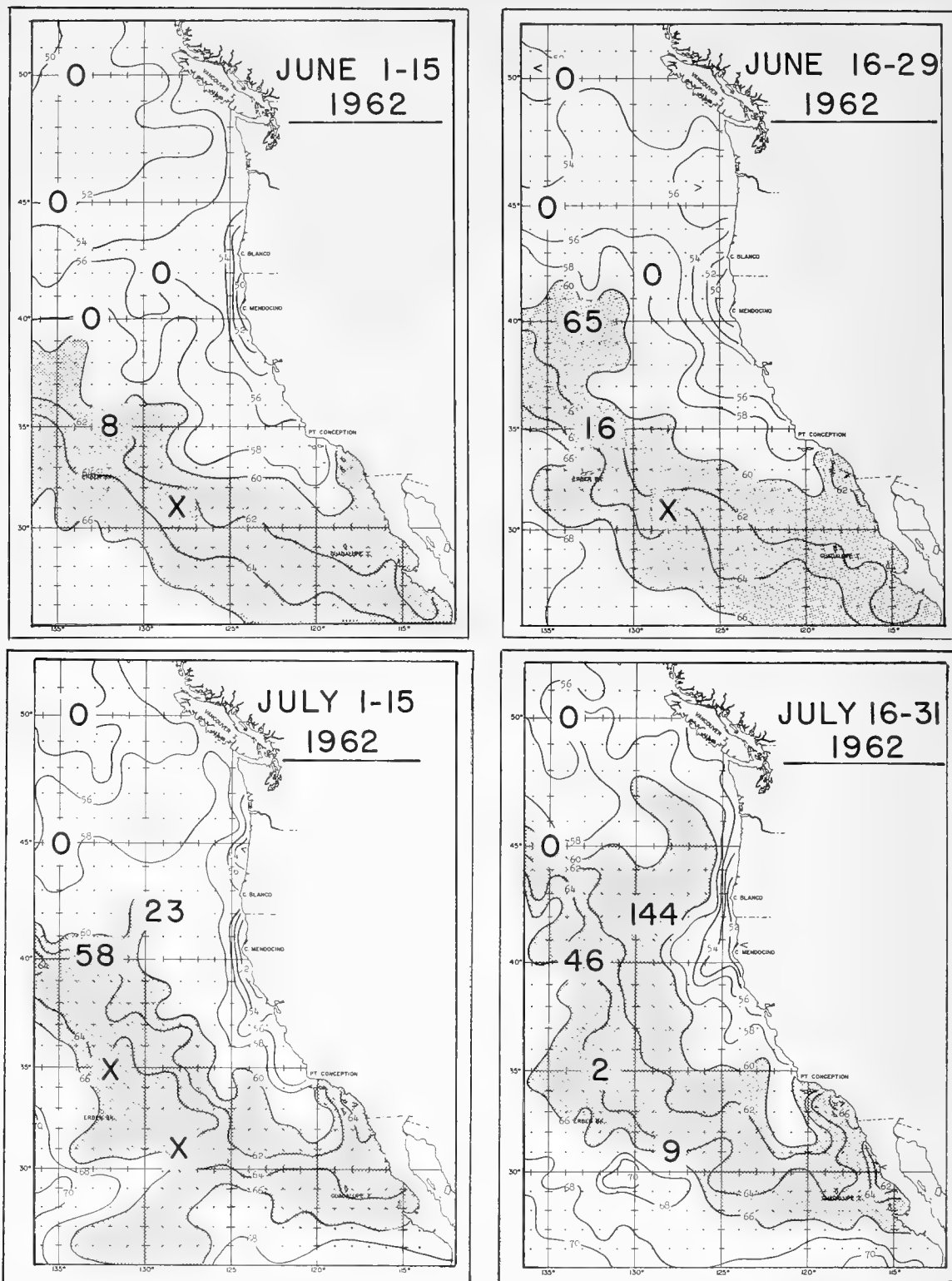


Fig. 1 - Albacore catch by U. S. Navy radar picket vessels in June-July 1962. Large numerals represent the catch at each station; small numerals indicate water temperature; and "X" indicates no fishing during the period. Shaded area delimits the 60°-66° F. temperature zone. More than two-thirds of the 1954-1958 California commercial albacore landings for June-September were taken from waters within these temperature limits.

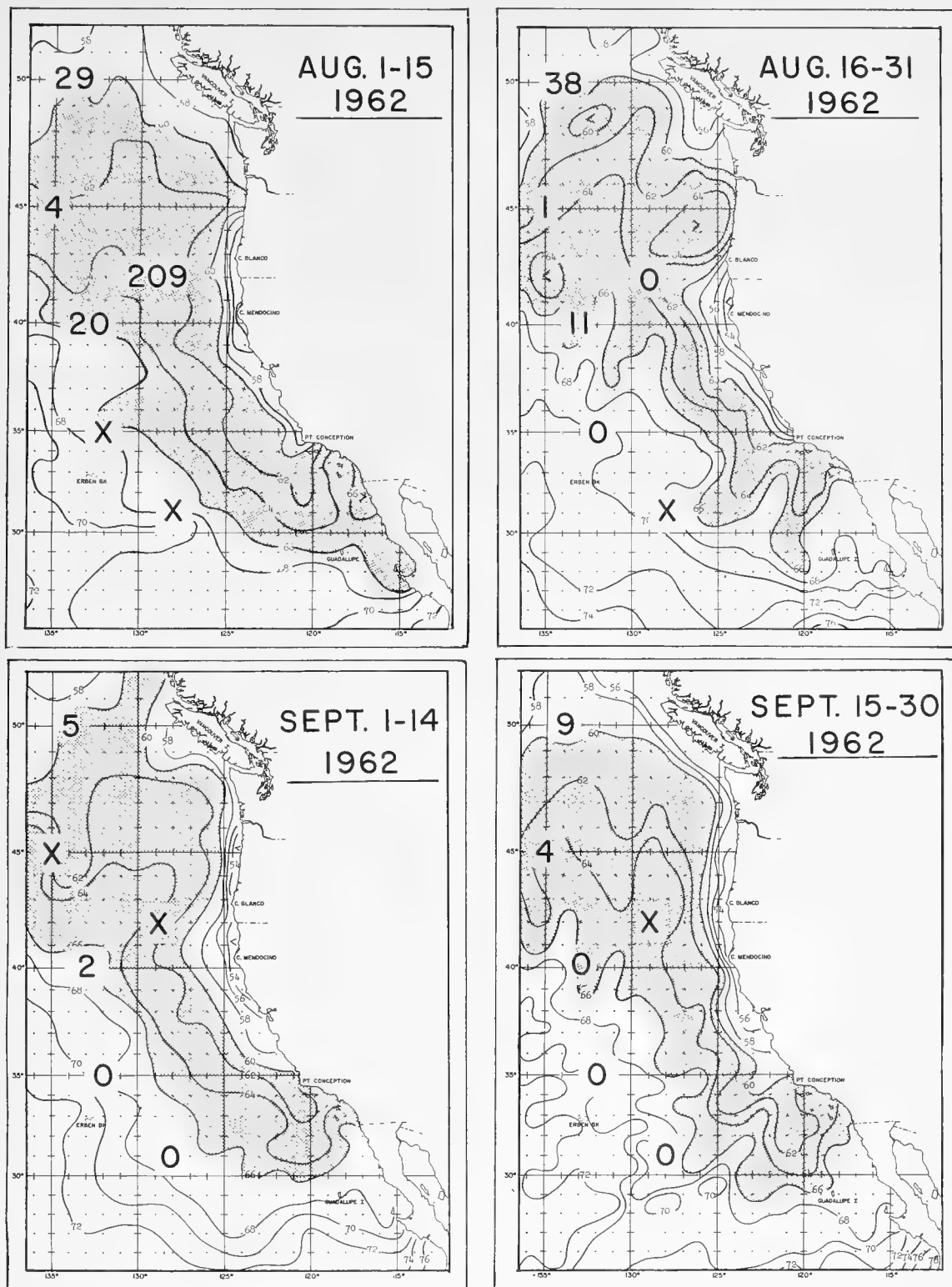


Fig. 2 - Albacore catch by U. S. Navy radar picket vessels in August-September 1962. Large numerals represent the catch at each station; small numerals indicate water temperature; and "X" indicates no fishing during the period. Shaded area delimits the 60°-66° F. temperature zone. More than two-thirds of the 1954-1958 California commercial albacore landings for June-September were taken from waters within these temperature limits.

Since the approximate positions of the northern stations monitored in 1962 differ by as much as 300 miles from last year's locations, the early-season catch data are not directly comparable. Comparisons are possible for those stations differing only slightly in location, however. Albacore appeared at station 5 (35° N., 132° W.) six days earlier than last year. The first catch was logged at station 4 (40° N., 133° W.) twelve days earlier than in 1961, whereas the first albacore was taken at station 3 (42° N., 129° W.) just one day later than last year. Major changes in positions of stations 1 and 2 make comparisons with earlier years hazardous; nevertheless, the indication of early northward movement was verified by the development of a good early-season fishery off the Oregon coast in the second week of July, even though sea temperatures in this region averaged about 2 degrees colder than in the same period last year.

Water temperatures at the northernmost stations ranged from 62°-63° F. at commencement of fishing. Good fishing was experienced at station 1, beginning on August 6, and ending on August 31. This station made a record catch of 82 fish for the season, far higher than in 1960 and 1961.

The rapid northward progression of the albacore fishery and its relation to the annual northward extension of the 60°-66° F. sea temperature zone was discussed in the December 1961 issue of the California Fishery Market News Monthly Summary, Part II - Fishing Information (Flittner, 1961). This relationship was further substantiated by the catch-temperature distributions this year (figs. 1 and 2, pp. 8 and 9). The "optimum temperature" zone was shaded in figures 1 and 2 to emphasize the changes in isotherm configuration which occur in periods as short as 15 days. The 60°-66° F. temperature range was selected on the basis of California Department of Fish and Game albacore landing data for the years 1954-1958 (Clemens 1961). More than two-thirds of the total commercial landings for the months June-September were caught in waters ranging from 60°-66° F. during these years. Only 14 percent of the 1962 total picket vessel catch was taken from waters outside these temperature limits.

The highest total catch for the year was reported by vessels monitoring station 3 off the California-Oregon boundary (table 2). During July and the first half of August, catches were made on 35 of 46 consecutive days. Unfortunately, fishing activities were terminated in the second half of August, thus preventing determination of the actual length of time good fishing may have continued in this area. That this station produced good fishing which was not the result of extra fishing effort on the part of enthusiastic crew members is shown in table 3. The highest average catch rates per 100 line-hours of trolling were achieved at this station.

Table 2 - Albacore Catch and Number of Days on Which Fish Were Taken by U. S. Navy Radar Picket Vessels Trolling on Station, June-October, 1962

Station and Item	Period										Totals
	June		July		August		September		October		
	1-15	16-30	1-15	16-31	1-15	16-31	1-14	15-30	1-15	16-31	
<u>1</u>											
Number of fish	0	0	0	0	29	38	$\frac{1}{5}$	9	$\frac{1}{0}$	1	82
Number of days	0	0	0	0	6	10	$\frac{1}{4}$	2	$\frac{1}{0}$	1	23
<u>2</u>											
Number of fish	0	0	0	0	$\frac{1}{4}$	$\frac{1}{1}$	X	$\frac{1}{4}$	1	0	10
Number of days	0	0	0	0	$\frac{1}{2}$	$\frac{1}{1}$	X	$\frac{1}{4}$	1	0	8
<u>3</u>											
Number of fish	0	0	23	144	209	$\frac{1}{0}$	X	X	X	X	376
Number of days	0	0	7	13	15	$\frac{1}{0}$	X	X	X	X	35
<u>4</u>											
Number of fish	0	65	58	46	20	$\frac{1}{11}$	2	1	0	2	205
Number of days	0	11	12	11	6	$\frac{1}{6}$	2	1	0	1	50
<u>5</u>											
Number of fish	8	16	X	$\frac{1}{2}$	X	0	0	0	0	0	26
Number of days	3	6	X	$\frac{1}{2}$	X	0	0	0	0	0	11
<u>6</u>											
Number of fish	X	X	X	$\frac{1}{9}$	X	X	0	0	0	0	9
Number of days	X	X	X	$\frac{1}{2}$	X	X	0	0	0	0	2
Total number of fish	8	81	81	201	262	50	7	14	1	3	708
Total number of days	3	17	19	28	29	17	6	7	1	2	129

1/Station not fished entire period.

Table 3 - Albacore Catch, Catch Rates and Distribution of Fishing Effort by U. S. Navy Radar Picket Vessels Trolling on Station, June-October, 1962

Station and Item	Period										Totals
	June		July		August		September		October		
	1-15	16-30	1-15	16-31	1-15	16-31	1-14	15-30	1-15	16-31	
1											
Number of fish	0	0	0	0	29	38	1/5	9	1/0	1	82
Line-hours fished	420	420	480	184	456	1526	504	198	840	1920	6948
Catch per 100 line-hours	0.0	0.0	0.0	0.0	6.4	2.5	1.0	4.6	0.0	0.1	1.2
2											
Number of fish	0	0	0	0	1/4	1/1	X	1/4	1	0	10
Line-hours fished	356	488	328	448	528	336	X	432	675	176	3767
Catch per 100 line-hours	0.0	0.0	0.0	0.0	0.8	0.3	X	0.9	0.1	0.0	0.3
3											
Number of fish	0	0	23	144	209	1/0	X	X	X	X	376
Line-hours fished	420	448	1520	1776	1340	224	X	X	X	X	5728
Catch per 100 line-hours	0.0	0.0	1.5	8.1	15.6	0.0	X	X	X	X	6.6
4											
Number of fish	0	65	58	46	20	1/11	2	1	0	2	205
Line-hours fished	468	1602	1032	720	726	364	1728	1632	420	416	9108
Catch per 100 line-hours	0.0	4.1	5.6	6.4	2.8	3.0	0.1	0.1	0.0	0.5	2.2
5											
Number of fish	8	16	X	1/2	X	0	0	0	0	0	26
Line-hours fished	307	758	X	216	X	500	637	156	420	448	3442
Catch per 100 line-hours	2.6	2.1	X	0.9	X	0.0	0.0	0.0	0.0	0.0	0.8
6											
Number of fish	X	X	X	1/9	X	X	0	0	0	0	9
Line-hours fished	X	X	X	138	X	X	630	576	420	448	2212
Catch per 100 line-hours	X	X	X	6.5	X	X	0.0	0.0	0.0	0.0	0.4
Totals:											
Number of fish	8	81	81	201	262	50	7	14	1	3	708
Line-hours fished	1971	3716	3360	3482	3050	2950	3499	2994	2775	3408	31205
Catch per 100 line-hours	0.4	2.2	2.4	5.8	8.6	1.7	0.2	0.5	0.0	0.1	2.3
1/Station not fished entire period.											

1/Station not fished entire period.

During the July 1-August 15 interval mentioned earlier, catch rates rose from 1.5 to 15.6 fish per 100 line-hours, respectively. Optimum water temperatures prevailed for an extended period beginning on July 1 and ending on October 15. The gradual improvement in average fishing success through the season for all stations combined is shown also in table 3. Catch per 100 line-hours of fishing rose to a peak of 8.6 fish during the August 1-15 interval, dropped sharply during August 16-31, and then declined steadily thereafter.

For the third consecutive year, trolling was most successful in the region lying between latitudes 40°-42° N. and longitudes 128°-134° W. The accumulated evidence for this area strongly suggests that the annual migration of albacore toward the Pacific coast feeding areas centers in this region and extends over a 60-day period. The fish entering the coastal waters appear to congregate in this area within the "optimum temperature" zone, and seem to split into two migratory components: the early arrivals proceed to southern feeding areas within the prevailing NW.-SE. oriented isothermal pattern (fig. 1, June 1-15, 16-29), and the late arrivals turn to the northward as soon as the tongue of warm water proceeds northeastward to the coast off Oregon and Washington (fig. 1, July 1-15, 16-31). These two segments of the albacore population then appear to merge off central California-southern Oregon in the month of August as the isotherm field consolidates (fig. 2, August 1-15, 16-31), and apparently move offshore as the temperature field commences its annual cooling trend (fig. 2, September 15-30). These movements are schematized in figure 3. It is likely that in cold years, when the northeastward extension of warm water fails to develop off Oregon and Washington, the entire population moves southward toward the coast in a thermal zone similar to the June pattern.

That fishing may continue into late fall within these thermal limits is further evidenced by the November catch of 16 albacore (ranging from 7-11 lbs.) by the U. S. S. Locator at sta-

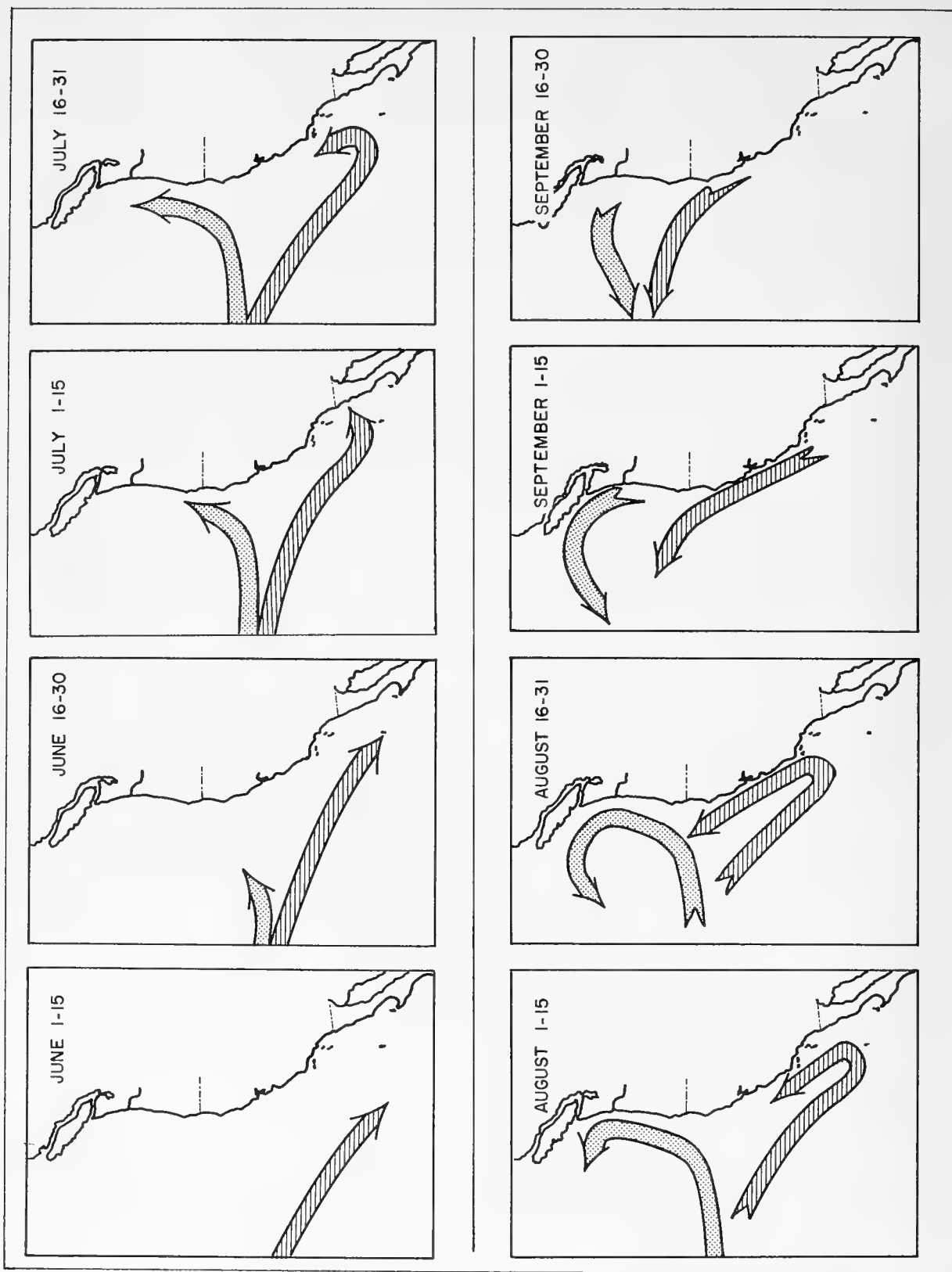


Fig. 3 - Schematic model of albacore movement off the Pacific coast as suggested by U. S. Navy picket vessel catch data, 1960-1962. Hatched arrow represents the southern (early) migratory component; stippled arrow represents the northern (late) migratory component.

tion 4. This catch of small fish was coincident with persistent late-season fishing into October and early November off southern California, when small fish were reported to be very abundant.

The U. S. S. Picket carried off the honors in total catch this year: 309 albacore were landed of a grand total of 724 fish for all vessels combined. This vessel also held top position in daily catch: 37 albacore were taken at station 3 on both July 29 and August 8.

Age-group representation in the 1962 picket vessel catch varied considerably from 1961. Whereas in 1961 the 31-inch group (78-80 cm.) comprised about 24 percent of the total catch, this year it made up less than 3 percent of the catch (fig. 4). The 25-inch (62-64 cm.) group dominated the 1962 catch, making up approximately 58 percent of the total; last year it contributed about 40 percent of the catch. The 21-inch (52-53 cm.) group contributed 38 percent of the total catch, about the same percentage as last year. The remaining 1 percent of the 1962 catch consisted of both very small and large albacore. A 15-inch albacore (38 cm.) was taken at station 3 on July 21, and a 38-inch fish (97 cm.) weighing 42 pounds was caught at station 6 on July 18.

The high degree of correlation between sea temperatures and albacore distribution and availability can be seen readily from the preceding figures. The rapid shift in geographic distribution of sea temperature and catch in periods as short as 15 days should be of particular interest to all fishermen. A method of predicting sea temperature distributions is being sought.

The continuing enthusiasm on the part of Radar Picket Squadron One personnel made the 1962 season most successful. Although two vessels (Picket, 309 fish; Watchman, 160 fish) took the major portion of the catch, the smaller catches and negative reports from other participating vessels were of equal value in contributing to our understanding of the distribution of albacore off the Pacific coast. Once again, tuna researchers and albacore fishermen alike are grateful to the officers and men of Radar Picket Squadron One for their continued interest and participation in the trolling program.

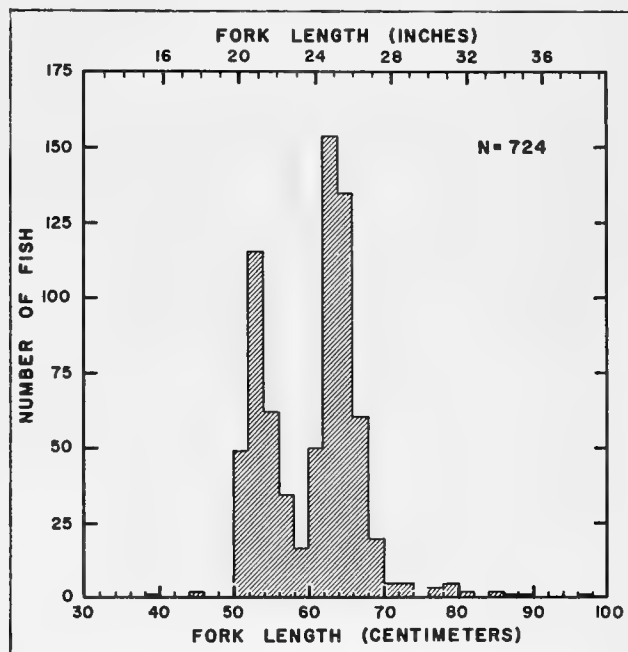


Fig. 4 - Length-frequency distribution of albacore taken by U. S. Navy radar picket vessels trolling on station, June-November 1962. All stations combined.

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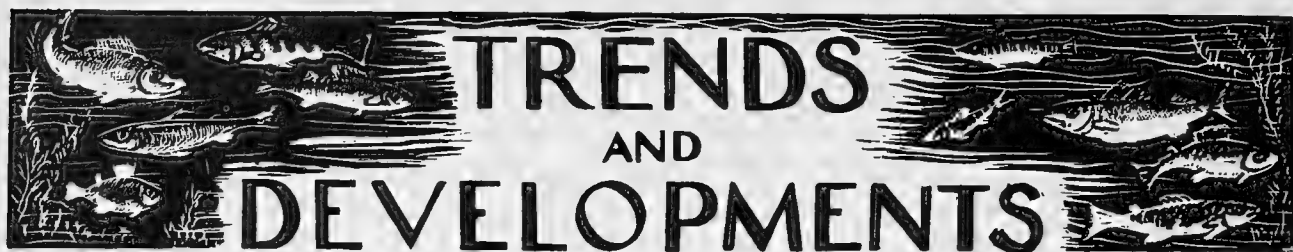
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TRENDS AND DEVELOPMENTS

California

ARTIFICIAL FISHING REEF MADE FROM QUARRY ROCK:

The first strictly "production model" artificial fishing reef has been built off Redondo Beach, Los Angeles County, the California Department of Fish and Game reported in February this year.

Patterned after earlier experimental models developed by the Department, the 625-foot quarry rock reef was financed by the County's fish and game fine money. State law requires that one-half of the money collected from fish and game violation fines be retained by the County to be used for fish and wildlife projects.

The reef area will be marked with buoys and opened to fishing when the fish population becomes sufficient to support a sport fishery, probably about July of this year.

The reef is expected to attract populations of sand bass, kelp bass, croakers, bonito, California halibut, and other species. In the experimental program, up to 1,300 fish have been counted at a single reef site.

The Wildlife Conservation Board experimented with three reefs in Santa Monica Bay in 1960. They were located in different areas and made of different materials. Old car bodies, streetcar bodies, artificial rock, and quarry rock were used in the experimental program, and the latter proved to attract the most fish. It is also more durable.

The Board has allocated funds for 4 quarry rock reefs, 2 off Orange County and 2 off San Diego County. Orange County also plans to build 2 reefs with fish and game fine money.

* * * * *

FLOODS DAMAGE FISH STOCKS OF HATCHERIES:

Three days of heavy rain at the end of January 1963 resulted in floods which caused

large fish losses at three hatcheries of the California Department of Fish and Game. Affected were the Trinity River Hatchery in Trinity County, the Nimbus Hatchery on the American River in Sacramento County, and the Kern River Hatchery in Kern County.

Silt-laden water killed 350,000 of the remaining 800,000 king salmon fry at the Trinity River Hatchery. About 1,200,000 salmon fry already had been planted.

At the Nimbus Hatchery, floods and silt killed 230,000 yearling steelhead, thus wiping out a major part of the steelhead stock developed for planting in the American River in 1963. Only 58,000 yearling steelhead from Nimbus had been planted in January 1963 before the flood.

Most of the fish racks at Nimbus, which block fish passage upstream and divert fish into a ladder leading to the hatchery, were washed out. This is expected to reduce to a trickle the number of steelhead entering hatchery ponds for the rest of 1963, although 530 adult steelhead moved into the ponds during the storm. Salmon egg taking at Nimbus had about ended before the storm, and the floods did little damage to steelhead eggs or to salmon eggs and fry. The Hatchery hopes to be able to meet 1964 steelhead planting needs with the present supply of steelhead eggs.

At the Kern River Hatchery, about 225,000 trout which would have been stocked for fishermen to catch this summer were washed into the river. Only about 10,000 are expected to be recovered. Some of the trout lost will survive to provide good fishing this summer in the Isabella Reservoir and nearby waters. Fingerling trout will be transferred to Kern from other hatcheries, to be raised to meet catchable trout planting needs this summer.

The California Department of Fish and Game estimated that silt and floods would cause some damage to fish and spawn in the

streams, but higher flows of water would benefit other young fish by helping them out to sea. (California Department of Fish and Game, February 9, 1963.)

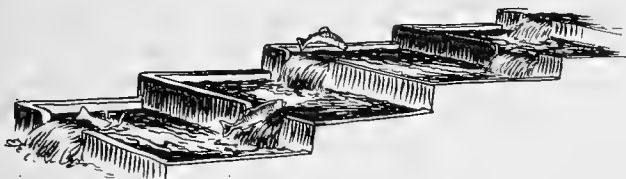
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NEW FISHWAY MAY REESTABLISH KING SALMON RUN ON EEL RIVER:

The reconstructed fishway at Snow Mountain, which provides passage for salmon and steelhead trout over Van Arsdale Dam on the Eel River, is paying dividends, according to the California Department of Fish and Game.

King salmon have been counted climbing the fishway ladder for the first time in 12 years.

The old fishway at Van Arsdale Dam was built in the 1930's. Salmon runs above the



Fish ladders are a series of adjoining pools to help fish get past dams or falls.

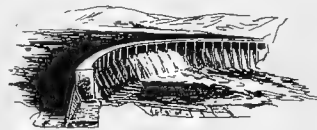
dam began to decline when migrating fish found water spilling over the dam more attractive than the fishway. Salmon and steelhead would jump against the dam in a futile attempt to get over it. Steelhead would eventually make their way to the fishway, but the ladder's high steps and small pools made passage difficult. Many were taken from the ladder and trucked above the dam to help them on their way.

King salmon wouldn't even try the fishway. Salmon runs declined from the thousands to

the hundreds, then virtually stopped in the 1950's.

The redesigned facility at Van Arsdale Dam channels fish directly into the fishway, so they have no opportunity to jump against the dam. The new fishway ladder is designed for jumps of 12 inches or less, compared to 18- to 24-inch jumps in the past. Pools are a minimum of three feet deep, compared to 18 to 24 inches in the old fishway.

The fishway was redesigned and rebuilt by the California Department of Fish and Game in an effort to restore the once heavy king salmon runs to spawning areas above the dam.



Cans--Shipments for Fishery Products, January-December 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants in 1962 was 6.3 percent above that used during 1961. The increase was due to a gain of 26.9 percent in combined shipments to the Eastern, Southern, and North Central Areas. The pack of Maine sardines in 1962 was much greater than in 1961. There was also an increase in the 1962 pack of tuna, salmon, and shrimp, but there was a decline in the California pack of mackerel, sardines, and anchovies.



In 1962, shipments to the Pacific or Western Area accounted for 68.3 percent of total shipments; shipments to the Eastern Area accounted for 28.5 percent; and shipments to

U. S. Domestic Shipments of Metal Cans for Fishery Products, 1962 and 1961
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter ^{1/}		Fourth Quarter		Total	
	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961
East ^{2/}	158,531	3/	189,556	3/	340,715	3/	191,087	3/	879,889	3/
Southern	13,403	3/	32,668	3/	21,765	3/	30,269	3/	98,105	3/
North Central	63	3/	29	3/	22	3/	26	3/	140	3/
Total ^{3/}	171,997	193,197	222,253	215,510	362,502	180,504	221,382	181,861	978,134	771,072
West ^{4/}	414,199	335,133	701,831	708,423	562,168	633,374	425,942	450,363	2,104,140	2,127,293
Total all Areas	586,196	528,330	924,084	923,933	924,670	813,878	647,324	632,224	3,082,274	2,898,365

^{1/}Revised.

^{2/}Includes Puerto Rico.

^{3/}The grouping of States by geographic areas for reporting purposes was changed in 1962, so only total shipments in 1961 to the East, Southern, and North Central Areas are shown.

^{4/}Includes Alaska and Hawaii.

the Southern Area accounted for most of the remaining 3.2 percent. Most of the fish-canning facilities are located in the Pacific Area.

Note: (1) Statistics cover all commercial and captive plants known to be producing cans. The data for 1961 cover only shipments of steel (tinplate) cans, but the data for 1962 cover shipments of steel and aluminum cans. It is believed that only a small amount of aluminum is being used in cans for fishery products at present. The tonnage equivalent figure for 1961 data is derived by use of the factor 23.0 base boxes per short ton of steel. The tonnage equivalent figure for 1962 data is derived by use of the factor 21.8 base boxes per short ton of steel. A "base box" is an area 31, 360 square inches, equivalent to 112 sheets 14" x 20" size.

(2) See Commercial Fisheries Review, March 1963 p. 21, August 1962 p. 17.



Central Pacific Fisheries Investigations

PLANS FOR PARTICIPATION IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

The staff of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu early in January this year was actively preparing to carry out research on the fishes and fishery resources of the Indian Ocean, as part of the United States participation in the International Indian Ocean Expedition. A massive scientific effort mounted with about 40 research vessels from 20 countries, the Expedition represents an attempt to apply to a single ocean basin the kind of complex international scientific cooperation that produced such fruitful results during the International Geophysical Year. The total field work is to extend from 1961 to 1964 and will encompass submarine geology, physical and chemical oceanography, meteorology, as well as the marine biology of the Indian Ocean.

The studies by the Bureau's Laboratory staff are centered around the United States Program in Biology and its research vessel the Anton Brunn. The Brunn is scheduled to make nine cruises into the Indian Ocean and adjacent seas from March 1963 to December 1964. The United States Program in Biology is being administered by the Woods Hole (Mass.) Oceanographic Institution.

The Bureau's Honolulu Laboratory will plan and implement that part of the United States biological program which pertains to fishery biology. For the off-shore waters of the Indian Ocean the Laboratory has outlined an extensive ecological study of the apex fish predators such as tunas and billfish. Since the Japanese have a commercial long-line fishery already operating in the Indian Ocean,

the areas of high abundance of the commercially important fish species have been defined. The studies, therefore, will be centered around the collection of basic biological data to aid in understanding the inter-relationship between species and to study distribution of the apex predators in relation to the environment. Since the most pronounced environmental feature in the Indian Ocean is the change in wind regime (southwest monsoon and northeast monsoon), the two cruises for the collection of data on apex predators were selected to cover these two periods. The first cruise (cruise 2 of the Anton Brunn) will extend from May to July 1963 during the southwest monsoon, while the second cruise (cruise 5) will extend from January to March 1964 during the northeast monsoon. Although surface trolling will be carried out during all daylight runs, the principal sampling tool for the apex predators on both cruises will be the tuna long-lines. The fishing program will produce whole samples for taxonomic studies, size and sex data on all fish caught, blood samples for subpopulation studies and materials for determining the feeding habits and spawning cycles of the apex predators. Furthermore, since sampling will extend down to 40° S. latitude, some information on the southern extent of the distribution of some of the apex predators will be obtained.

While the data obtained from the two cruises by the Anton Brunn will be limited in scope and application, several studies will be implemented by data from other sources covering a wider area of the Indian Ocean. Emphasis will be on extending the study of the distribution of tuna larvae and juveniles and obtaining blood samples for subpopulation studies from areas other than those covered during the two cruises. For the study on the relation of the apex predators and the environment plans include (1) an ocean-wide analysis of the large body of physical and chemical data which will be available at the end of the Expedition, (2) a study of the copepods of the genus Candacia as indicators of water masses, and (3) an analysis of all available catch and effort data for apex predators in the Indian Ocean in relation to the environment.

A second phase of the Laboratory's program in the Indian Ocean will be centered on the bottom fish and invertebrate resources of the Bay of Bengal and the Arabian Sea. A series of inshore-offshore transects with a 42-foot trawl will be made in the Bay of Ben-

gal during the March to May 1963 cruise of the Anton Brunn. A similar sampling program will be carried out in the Arabian Sea during the September to December 1963 cruise.



Crabs

NEW PROCESSING MACHINERY FOR BLUE CRABS BEING DEVELOPED:

A contract on developing mechanical means of debacking and cleaning cooked blue crabs is being financed with funds provided by the U. S. Bureau of Commercial Fisheries. The contract is being supervised by the Bureau's College Park, Md., Technology Laboratory, and originally called for a simply designed and relatively inexpensive shop-model machine that could be used by all crab-meat packers. The developmental research by the contractor has shown so much promise that the contract has been extended to include the production of a plant prototype machine.

In November 1962, the contractor met with the Laboratory staff to discuss the direction of future work. At that time it was learned that they had developed what might be termed a revolutionary concept of a machine for cleaning and preparing crab cores for the picker. Using this new principle of core preparation, it looked entirely possible to make a machine that was so simple it could be manufactured for less than \$2,000. This compares with a cost of \$10,000 or more for any one of several machines with similar functions that have been developed by private inventors in recent years.

It developed during the meetings that the contractor's engineers had found the solution to the problem, and were so far along with the development of machinery that it would be a mistake to stop at the shop model stage. It was evident that with additional time of about two months and some extra funds the contractor would be able to go directly to the plant prototype. The proposed prototype design also included a concrete and apparently workable idea for extracting lump crab meat by machine. Following the November 1962 meetings between the Laboratory staff and the contractor's engineers, approval was obtained in late January this year to begin on the final phases of this machine development.

The extension of the contract calls for the design and production of a prototype machine

for handling cooked crabs, at the rate of about one per second, and producing a cleaned core in such a manner that the backfin lump can be readily removed. Prior to hitting upon the principle of the present cleaning machine, considerable work had been done on an automatic "orienter" that would take a mass of cooked crabs and feed them into a debacker-cleaner in a set position--for example, backs up, eyes to the left, if this was the desired orientation for the next step. However the design of this machine was fairly complex and consequently it has been bypassed for the present, it being felt that most plants would find it much more economical to use two or three workers to orient visually and feed manually the debacker-cleaning machine.

With the contractor's efforts concentrated on the final design and fabrication of the cleaning machine only, it was estimated, that this could be completed in early April. As soon as the machine can be installed in a plant, and the spring run of crabs starts to provide working material, interested industry members will be invited to observe the machine in operation. The demonstration will be followed by a meeting with an industry committee to discuss and approve plans for the next steps toward mechanization. Depending on the priority assigned by this committee, the "orienter" described above might be completed next, or the next steps might more logically be, first the development of a mechanical lump picker, then the flake meat picker. Both of these machines are in what might be described as an advanced conceptual stage.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers during the third quarter of 1962 than in the same period of 1961. The increase was 4.3 percent in quantity and 38.4

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, July-September 1962 with Comparisons

QUANTITY				VALUE			
July-Sept. 1962	1961	Jan., -Sept. 1962	1961	July-Sept. 1962	1961	Jan., -Sept. 1962	1961
..... (1,000 lbs.) .....				..... (\$1,000)			
5,961	5,715	17,934	16,587	4,213	3,044	10,975	8,355

percent in value. During the first nine months of 1962, purchases were up 8.1 percent in quantity and 31.4 percent in value, as compared with the same period in 1961. Because of the purchase of higher-priced fishery products and an increase in the price of most fishery products, the value increased more than the quantity.

Canned: Purchases of canned fishery products for the use of the Armed Forces in the third quarter of 1962 were extremely

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, July-September 1962 with Comparisons

Product	QUANTITY				VALUE			
	July-Sept.		Jan.-Sept.		July-Sept.		Jan.-Sept.	
	1962	1961	1962	1961	1962	1961	1962	1961
	(1,000 lbs.)				(\$1,000)			
Tuna	1	1,731	3,708	4,393	1/	765	2,062	1,940
Salmon	1	1,401	1,016	1,403	1/	891	638	893
Sardines	15	31	65	121	6	13	31	57

1/Less than \$1,000.

light. In the first 9 months of 1962 purchases of the three principal canned fishery products (tuna, salmon, and sardines) were down 19.1 percent in quantity and 5.5 percent in value as compared with the same period in 1961.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Fish Oils

MOLECULAR DISTILLATION AIDS RESEARCH ON POLYUNSATURATES:

During 1962, close to 4,000 pounds of crude fish oil and fish oil derivatives such as fatty acids and fatty esters were refined by adsorptive bleaching and molecular distillation at the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The material processed was distributed to other laboratories for research purposes.

Molecular distillation has provided a means of obtaining oil samples with a higher percentage of polyunsaturates which are of particular interest to researchers.

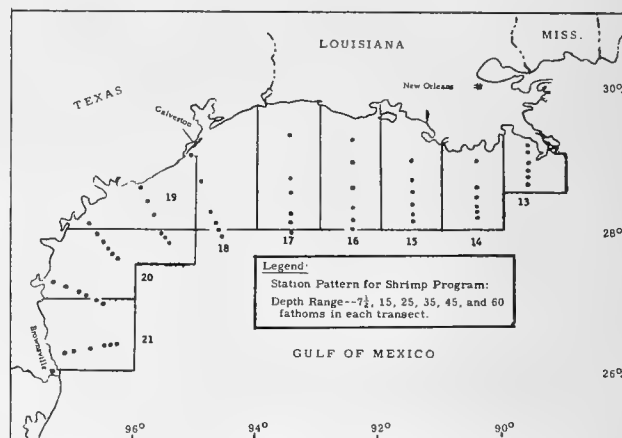
Although most of the material was sent to laboratories interested in nutritional research, some was also sent to laboratories that were interested in chemical derivatives and other means of commercial utilization.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-1 (January 22-February 5, 1963): Catches were generally light during this cruise off the coast of Lou-



Shows the station pattern for Cruise GUS-1 of the chartered research vessel Gus III, January 22-February 5, 1963.

isiana and Texas by the chartered research vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico.

Eight statistical areas (13, 14, 15, 16, 17, 18, 19, and 20) were covered. Because of severe weather, it was not possible to fish at all scheduled stations. But one 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-20, 20-40, and 40-60 fathoms) in all areas, except area 20.

The best single catch per 3-hour tow was 51 pounds of 12-15 count brown shrimp taken from 20-40 fathoms in statistical area 17. The other areas yielded fair catches of brown shrimp as follows: 34 pounds (31-40 count) from the 0-20 fathom range in area 18; 22 pounds (15-20 count) from the 0-20 fathom depth in area 19; 21 pounds (12-15 count) from 20-40 fathoms in area 20; 12 pounds (21-25 count) from the 20-40 fathom range in area 13; and 12 pounds (12-15 count) from 40-60 fathoms in area 14.

Areas 13 and 15 were the only areas producing more than a scattering of white shrimp. A catch of 13 pounds of 26-30 count white shrimp was taken from the 0-20 fathom range

in area 13. The white shrimp catch in area 15 consisted of 15 pounds (31-40 count) from the 0-20 fathom range and 15 pounds (21-25 count) caught at depths up to 40 fathoms.

Pink shrimp were taken at only 3 stations; the catch in each case was less than 1 pound.

Notes: (1) Shrimp catches are heads-on weight, shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, February 1962 p. 37.



Industrial Fishery Products

FISH MEAL MARKET TRENDS IN SOUTHEASTERN STATES SURVEYED:

In late January and early February this year, a U. S. Bureau of Commercial Fisheries animal nutritionist, visited scientists at the Arkansas Agricultural Experiment Station and representatives of mixed feed corporations at various localities in Arkansas and southern Missouri and at Memphis, Tenn. He made these visits following his attendance at the Southeastern Poultry and Egg Association Convention at Atlanta, Ga., January 28 to 30.

At the Convention, it was pointed out that a general trend toward increased egg production in the Southeastern States is in evidence. However, this growth of the egg production industry appears not to be at the expense of the broiler industry; the latter is growing also but at a decelerating rate. Much of the new egg production can be absorbed by the producing States. For example, Florida is leading the present expansion but does not as yet produce enough eggs to satisfy its own needs. This expansion will result in some increase in utilization of fish reduction products. Poultry breeder rations are usually supplied with fairly liberal proportions of fish meal, and laying rations usually contain some fish meal although the concentration of the meal in layer rations is ordinarily only a fraction of 1 percent. Thus the long-term prospect appears to be that demand for fish meal in the Southeast will increase.

Investigators at the Arkansas Agricultural Experiment Station reported to the animal nutritionist further progress toward obtaining the fish unidentified growth factors in highly concentrated form. However, until they can isolate the factors in pure chemical form, analyze them, and produce them by chemical synthesis, fish products will remain

the most reliable source of these factors.

Nutritionists employed by mixed feed companies are showing a great deal of interest in methods of determining the quality of protein in fish meal. Some of them hope to be able, eventually, to determine the quality of the protein in each shipment of fish meal they buy.

* * * * *

MORE FEDERAL SPECIFICATIONS FOR USE OF FISH OIL IN PAINTS REQUIRED:

The use, procurement, and testing of paints and other organic coatings by the Federal Government were surveyed by a chemical engineer of the U. S. Bureau of Commercial Fisheries. He learned that there is no Federal Specification for fish oil for use in organic coatings.

There are several Federal Specifications which permit the use of fish oil in paint, varnish, and related materials, provided the products meet performance specifications. They are:

(1) TT-P-0085a (DOD); Interim Federal Specification; Paint, Reflectorized, for Airfield Runaway Marking (Drop-in-Type).

(2) TT-P-00530 (NAVY-Ships); Interim Federal Specification; Coating Compound, Rust Inhibitive, Fish Oil Base.

(3) TT-P-664a; Federal Specification; Primer Coating, Synthetic, Rust-Inhibiting, Lacquer-Resisting.

(4) TT-P-666a; Federal Specification; Primer Coating, Zinc Yellow, for Aluminum and Magnesium Surfaces.

(5) TT-P-781a; Federal Specification; Putty and Elastic Compound; (for) Metal Sash Glazing.

The above list can be expanded, once the basic fish oil quality is covered by specification. The Government agencies using the paints will require proof of superior performance for unit cost or equal performance at lower cost compared to products covered by existing specifications.

The next step required in establishing a Federal Specification for fish oil for use in organic coatings is the drawing up of a sug-

gested specification patterned after Federal Specifications TT-S-600, Soybean Oil (for use in organic coatings) or TT-L-215a, Linseed Oil, Raw (for use in organic coatings).

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, 1961-62: Based on domestic production and imports, the United States available supply of fish meal for 1962 was 31,461 short tons (or 6.2 percent) greater than during 1961. Domestic production was 3,001 tons (or 1.0 percent) less and imports were 34,462 tons (or 15.8 percent) greater than in 1961. Peru continued to lead other countries with shipments of 186,249 tons during 1962--34,810 tons above the imports in 1961.

The United States supply of fish solubles (including homogenized fish) during 1962 was 10,743 tons more than during 1961. Domestic production increased 10.0 percent, but imports dropped 6.4 percent.

U. S. Supply of Fish Meal and Solubles, 1961-62		
Item	1/ 1962	1961
... (Short Tons) ...		
Fish Meal and Scrap:		
Domestic production:		
Menhaden	243,839	247,551
Tuna and mackerel	20,874	21,243
Herring	3,543	5,268
Other	20,080	17,275
Total production	288,336	291,337
Imports:		
Canada	42,806	38,218
Peru	186,249	151,439
Chile	9,247	12,074
Angola		1,543
So. Africa Republic	10,084	13,026
Other countries	3,921	1,545
Total imports	252,307	217,845
Available fish meal supply	540,643	509,182
Fish Solubles:		
Domestic production ^{2/}	123,415	112,241
Imports:		
Canada	1,335	1,001
So. Africa Republic	1,717	1,351
Other countries	3,256	4,387
Total imports	6,308	6,739
Available fish solubles supply	129,723	118,980
1/ Preliminary.		
2/ 50-percent solids. Includes production of homogenized condensed fish.		

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, January 1963: United States fish meal and fish oil production in January 1963 was lower by 26.8 percent and 46.2 percent, respectively, as compared with January 1962. Fish solubles production decreased 8.4 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, January 1963					
Item and Period	1963	1962	1961	1960	1959
..... (Short Tons)					
Fish Meal:					
Production ^{1/} :					
March	-	2,495	2,751	2,955	2,122
February	-	2,066	2,071	1,923	2,128
January	2,000	2,732	2,723	2,443	3,095
Jan.-Dec. prelim. totals ^{2/}	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tots.	-	-	311,265	290,137	306,551
Imports:					
March	-	18,528	20,458	18,652	16,719
February	-	18,819	14,344	8,081	19,463
January	-	25,427	9,531	8,571	19,700
Jan.-Dec.	-	252,307	217,845	131,561	132,925
Fish Solubles:					
Production ^{3/} :					
March	-	1,903	2,564	2,462	2,382
February	-	1,566	1,650	1,812	2,211
January	1,500	1,637	1,800	1,697	1,913
Jan.-Dec.	-	123,402	112,241	98,929	165,359
Imports:					
March	-	308	135	87	410
February	-	2,249	155	1,875	398
January	-	273	219	214	1,567
Jan.-Dec. totals	-	6,308	6,739	3,174	26,630
..... (1,000 Gallons)					
Fish Body Oils:					
Production:					
March	-	42	63	66	42
February	-	49	44	51	38
January	50	93	55	46	64
Jan.-Dec. prelim. totals ^{4/}	-	33,178	33,471	26,690	24,418
Jan.-Dec. final tots.	-	-	34,409	27,853	24,945
Exports:					
March	-	2,556	753	421	600
February	-	2,886	2,327	3,177	999
January	-	679	1,793	276	898
Jan.-Dec.	-	16,407	16,331	19,154	19,264
1/ Does not include crab meat, shrimp, and misc. meals.					
2/ Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.					
3/ Includes homogenized fish.					
4/ Preliminary data computed from monthly data. Represents over 95 percent of the total production.					
Note: Data for 1962 and 1963 are preliminary.					

* * * * *

Production, December 1962: In December 1962, production of fish meal (2,349 tons) was only a fraction of the 12,763 tons produced in December 1961. Oil production also followed this pattern--only 78,099 gallons in December 1962 compared with 1.5 million gallons for December 1961. Bad weather over coastal North Carolina was responsible for the failure of the menhaden fishery in December 1962. Production of fish solubles and homogenized condensed fish in December 1962 was considerably less than in December 1961.

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, December 1962^{1/} with Comparisons

Product	December		Total	
	1/1962	1961	1/1962	1961
..... (Short Tons)				
Fish Meal and Scrap:				
Herring	-	-	3,543	5,268
Menhaden ^{2/}	308	9,407	243,839	247,551
Sardine, Pacific	-	650	743	2,518
Tuna and mackerel	1,463	2,053	20,874	21,243
Unclassified	578	653	19,337	14,757
Total	2,349	12,763	288,336	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	311,265
Fish solubles	1,481	4,596	112,764	100,551
Homogenized condensed fish	132	340	10,651	11,690
..... (Gallons)				
Oil, body:				
Herring	-	-	666,503	818,017
Menhaden ^{2/}	8,913	1,352,942	30,548,560	31,355,570
Sardine, Pacific	-	24,844	23,589	86,167
Tuna and mackerel	44,724	86,639	621,903	762,509
Other (including whale)	24,462	27,492	4,317,612	1,386,542
Total oil	78,099	1,491,917	33,178,167	34,408,805

1/Preliminary data.
2/Includes a small quantity produced from thread herring.
3/Not available on a monthly basis.
4/Includes estimates for those firms which do not normally report on a monthly basis.

Inventions

NEW FISH HOOK EXTRACTING DEVICE PATENTED:

The inventor of a new fish hook extracting device claims it will remove a fish hook without tearing the body of a fish. It is said to be simple, effective, and inexpensive. (Patent Number 3,027,676, U. S. Patent Office Classification Number 43-43.16, granted Earl Buttemeier, 4411 N. Greenview, Chicago 40, Ill.)

Maine Sardines

CANNED STOCKS, JANUARY 1, 1963:

Current canned stocks reflect the 1962 comeback of the Maine sardine after the drastic decline in the catch and pack in 1961. Cannery stocks of Maine sardines on Jan. 1, 1963, were 948,000 cases greater than those of Jan. 1, 1962, but only 63,000 cases above stocks on hand two years ago on Jan. 1, 1961. Distributors' stocks of canned Maine sardines were up 23.8 percent from stocks on hand Jan. 1, 1962, and 2.6 percent from those on hand Jan. 1, 1961.

On April 15, 1962, carryover stocks at the canners' level amounted to about 33,000 cases. Adding the 1962 season pack of 2,116,000 cases results in a total supply of

Table 2 - U. S. Foreign Trade in Selected Industrial Products, December 1962^{1/} with Comparisons

Product	Oct.		Nov.		Dec.		Total	
	1/1962	1961	1/1962	1961	1/1962	1961	1/1962	1961
..... (Short Tons)								
Imports:								
Fish meal and scrap	12,732	9,425	11,904	25,649	18,977	23,268	252,307	217,845
Fish solubles	290	110	435	3,649	387	472	6,308	6,739
..... (Gallons)								
Whale oil, sperm (crude and refined)	-	2,318,044	3,674,921	92,756	516,413	458,027	8,932,083	7,807,625
..... (Pounds)								
Exports:								
Fish and fish liver oils	219,241	15,201,869	171,127	1,424,773	171,813	10,484,236	123,049,705	122,485,721
Whale and sperm oil	30,300	49,452	3,328	902,160	705,704	84,110	2,696,522	1,205,674

1/Preliminary data.

Although the 1962 production of fish meal and oil was somewhat less than in 1961, the producers had a satisfactory year. Fish meal manufactured in 1962 totaled 288,336 tons--about 3,000 tons less than in 1961. The yield of oil (33 million gallons) was about 1.2 million gallons less than during the previous year. The year's production of fish solubles (112,764 tons) was heavier than the amount reported in 1961 (100,551 tons). Homogenized condensed fish production in 1962 amounted to 10,651 tons--about 1,000 tons less than in the previous year.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Cannery Stocks, January 1, 1963, with Comparisons

Type	Unit	1/1/63	1/1/62	1/1/61
Distributors ... actual cases		239,000	193,000	233,000
Cannery ... std. cases ^{1/}		1,092,000	1,44,000	1,029,000
^{1/} 100 3-oz. cans equal one standard case.				
Source: U. S. Bureau of the Census, <u>Canned Food Report</u> , January 1, 1963.				

2,149,000 cases as of January 1, 1963--up 89.8 percent from the total supply reported January 1, 1962, but down 7.9 percent from the total supply on January 1, 1961. Shipments between April 15, 1962 and January 1, 1963, amounted to 1,057,000 cases, up slightly from shipments of 988,000 cases during the comparable period in the previous year.

Table 2 - Canned Maine Sardines--Season Supply as of January 1, 1963, with Comparisons

Item	1963	1962	1961
	.... (Std. Cases 1/)		
Canners' carryover stocks on April 15 ^{2/}	33,000	457,000	335,000
Season pack ^{2/}	2,116,000	675,000	1,998,000
Total supply as of Jan. 1	2,149,000	1,132,000	2,333,000

1/100 3½-oz. cans equal one standard case.

2/The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1960 and 1961 season. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.



North Pacific

Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER CONTINUED:

M/V "John N. Cobb" Cruise 57: The ninth in a series of cruises designed to study deep-water marine fauna at stations established along a track line southwest of the mouth of



The U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.

the Columbia River was completed on February 6, 1963, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. The trip was part of a cooperative study with the Atomic Energy Commission. Six of the cruises in the series were made by the Bureau's chartered vessel Commando and three were made by the John N. Cobb.

A standard 400-mesh eastern commercial otter trawl with a small-mesh liner in the cod end was used to sample fauna at all 18 stations (with the exception of the 275-fathom station) out to 450 fathoms. Because of adverse weather conditions, the vessel was able to study only one station (1,000 fathoms) of the nine stations at depths greater than 450 fathoms.

Sablefish (Anoplopoma fimbria), turbot (Atheresthes stomias), ocean perch (Sebastes alutus), dogfish (Squalus acanthias), rex sole (Glyptocephalus zachirus), and Columbia River smelt (Thaleichthys pacificus) were the species of vertebrates found in greatest abundance at the stations surveyed. Columbia River smelt and rex sole dominated the catches from 50 to 100 fathoms, while ocean perch and dogfish dominated the catches from 125 to 175 fathoms. A relatively large catch (1,426 pounds of ocean perch and 1,056 pounds of dogfish per hour of trawling) occurred at the 150-fathom station. Sablefish was the main species caught between 200 and 450 fathoms. Turbot was found to be plentiful in the 175 to 250 fathom range and the idiot rockfish (Sebastes) from 350 to 450 fathoms. The most striking difference noted in the fish fauna during the cruise as compared to previous cruises was the small amount of Dover sole (Microstomus pacificus) in all the catches and the dominance of smelt and dogfish at the shallower stations.

In addition to sampling the fauna at each station, bottom temperatures, salinities, and bottom core samples were taken. The core samples were frozen for analysis by the Oceanography Department of the University of Washington.

Samples of fish collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington.

Over 1,000 sablefish and a few Dover sole were tagged by personnel from the Oregon Fish Commission who were aboard the vessel during part of the survey.

Also, the study on marine bacteria by personnel from the College of Fisheries, University of Washington was continued.

Note: See Commercial Fisheries Review, February 1962 p. 42.



Oceanography

NEW RESEARCH SUBMARINE:

The U. S. Fish and Wildlife Service's first submarine, a 2-man, 12-foot research vessel,

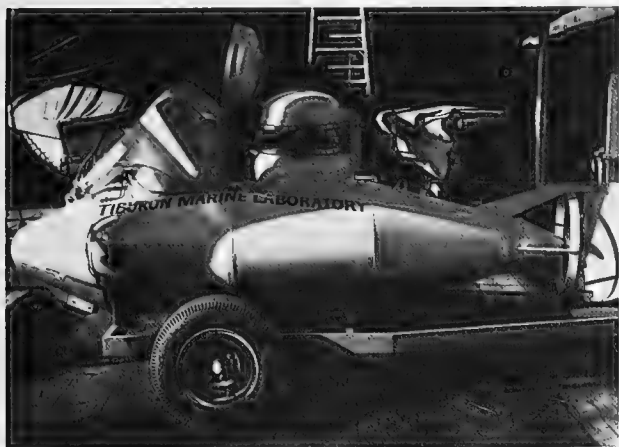


Fig. 1 - This 1-ton, 12-foot undersea research vessel can be hauled by trailer between fishery research assignments.

was delivered to the Fish and Wildlife Service Marine Laboratory at Tiburon, Calif., on February 18, 1963. Valued at about \$9,000, it is destined for a major role in undersea studies by the Bureau of Sport Fisheries and Wildlife.

The torpedo-shaped craft is a "dry" submarine. This means that the occupants--one operator and one passenger--are enclosed and protected from the sea. A major

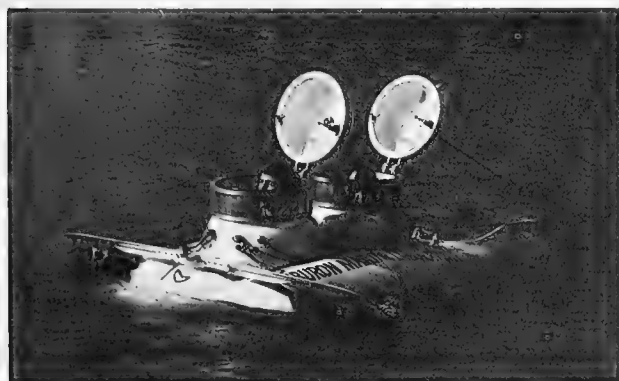


Fig. 2 - Two biologists from the Laboratory make a trial run in the 12-foot undersea research vessel.

problem in marine game fish research has been the inability of scientists to enter the undersea environment safely to make direct observations. By using the new battery-powered submarine, research biologists will now be able to accompany electronic and photographic equipment under water to re-

cord and observe marine creatures for extended periods.

Capable of operating to depths of 300 feet, the 2,000-pound underwater craft offers each occupant 360 degree viewing. It is radio-equipped and can cruise submerged for 10 hours at speeds ranging from 2 to 6 knots.

The submarine will be used for observing schooling and feeding behavior of fish, surveys of bottom conditions, locating concentrations of fish, and studies of shark behavior.

There are two conning towers on the submarine, one for each occupant. The front tower is canted forward and down to provide increased visibility directly ahead of the craft and of the sea bottom. The submarine is controlled by an airplane-type stick which permits rapid movement of hydroplanes and rudder at all speeds. Ballast tank controls and trim tanks permit the submarine to operate at positive, neutral, and negative buoyancy. It has two forward and two reverse speeds. An air filter system removes carbon dioxide, permitting the occupants to breathe clean air.

* * * * *

SECOND FOLIO OF NORTH ATLANTIC MARINE ENVIRONMENT SERIAL ATLAS:

Some 96,000 temperature readings taken at a depth of 200 meters throughout the North Atlantic Ocean have been organized and their distributions mapped in an atlas Folio issued on March 7, 1963, by the American Geographical Society.

The Folio is the second in a series being published by the Society under the general title, "Serial Atlas of the Marine Environment." The new Folio is the work of a scientist of the Woods Hole Oceanographic Institution, and represents data collected by the Institution as well as data from various agencies, including the National Oceanographic Data Center in Washington, D. C., and the Canadian Naval Research Establishment at Halifax, N. S.

The Folio consists of nine color plates, a brief explanatory text by the scientist, and 11 pages of statistical tables of the source data. The maps show average temperatures, maximum range of temperatures, anomalies, and seasonal distribution of the data.

The Serial Atlas, a type of atlas never before attempted in this country, was introduced

last year with the publication of the first Folio in the series, a study of sea surface temperatures in the Western North Atlantic. The Atlas is planned to effect interdisciplinary communication, to provide scientists with an essential means of making comparative studies, and to uncover areas of ignorance as well as of knowledge.

Each Folio in the series is a complete study in itself. Thus a more comprehensive picture of all aspects of the sea (physical, biological, chemical, and geological) is expected gradually to unfold. Scientists hope that many variables, so far undetected, will be pinpointed and that guide lines for future research will emerge. Among other Folios in preparation or in prospect are temperature studies at other critical depths; the detailed bathymetry of the North Atlantic and the Arctic Basin; the directions and velocities of winds and currents in the North Atlantic; a study of the seasonal distribution of ground-fish over Georges Bank and the Gulf of Maine; and an environment study of a particular species of clam, *Spisula polynyma*.

"The Serial Atlas of the Marine Environment" is an international project, with scientists on both sides of the Atlantic, in all disciplines dealing with the sea, participating. An advisory group will guide the project and recommend the suitability of topics.

Base maps, specially prepared by the American Geographical Society, are distributed to the contributing scientists, who use them as worksheets on which to plot and analyze their data. Contributions are then submitted to the society whose responsibility is to make final decisions regarding the form of presentations, to prepare the finished maps, and to edit the Folios for final publication.



Oregon

FISH PASSAGE FACILITIES OVER PELTON DAM EVALUATED:

A report covering an evaluation study of the fish passage facilities at a private power company's Pelton Dam on the Deschutes River was announced on February 27, by a 5-man steering committee composed of Oregon Fish Commission officials, scientists

of the U. S. Bureau of Sport Fisheries and Wildlife and U. S. Bureau of Commercial Fisheries, and a representative of the power company.

The report describes the results of a 3-year study initiated in May 1959 under an agreement between the State and Federal agencies and the company, which provided the \$114,000 required for the project.

Under the supervision of the Committee, the field work and data analysis were performed by the Fish Commission with assistance from the power company. Much valuable information was obtained with respect to fish passage problems as well as incidental material that will be of future value.

The permanent fish facilities at the Pelton project, which have been operable since 1958, consist of a fish ladder 2.8 miles long and a trap-and-truck combination for upstream-migrant fish. The downstream-migrant collection system at the dam introduces the fish into the ladder, which carries them to the river below the project.

Although the upstream-migrant collection system functioned satisfactorily and adult fish readily entered the trap, they were often reluctant to ascend the fish ladder during the summer months for reasons still to be determined.

The downstream migrants moved into and through the artificial outlet or "skimmer" as intended. Few wild fish left through the deeply submerged power tunnel or other possible exits.

The downstream passage efficiency for salmon was judged favorable in 1960, but seemed unfavorable in 1961. On examination of the records, however, it appeared that sufficient numbers of downstream migrants occurred to maintain the runs. But this did not appear to be true in the case of steelhead trout. In the two years examined, the one returnee per parent fish required to maintain the stocks was not achieved. This situation may or may not continue. Trends of abundance of those fish are affected by many factors other than the dam.

Counts of all fish, going both up and downstream past the Pelton project, were maintained continuously both before and since the evaluation period and will continue in the



future. Studies of the counts will provide additional information. Following completion of the Round Butte project immediately upstream, further evaluation of the Pelton fish passage facilities will be included in a four-year study of the Round Butte installation, which will also be financed by the power company.

* * * * *

NEW DIRECTOR OF FISHERIES RESEARCH APPOINTED:

The Oregon Fish Commission Director announced on February 20, 1963, the appointment of Dr. Donald W. Chapman as Director of Research, filling the position left by Sigurd J. Westrheim, now with the Fisheries Board of Canada in Nanaimo, B. C.

Chapman received his Bachelor of Science degree in Forest Management from Oregon State University in 1953, Master of Science degree in Fisheries, 1957, Oregon State University, and Ph.D. in Fisheries, 1961, also from Oregon State.

A veteran, Chapman has served as Research Assistant with the Oregon Cooperative Wildlife Research Unit; Coordinating Biologist for the Governor's Natural Resources Committee; and Coordinator, Alsea Watershed Study. At the time of his appointment he was an Assistant Professor of Fish and Game Management at Oregon State University. Since December 1960, Chapman has also been Executive Secretary of the Water Resource Research Institute.

Several of Chapman's writings dealing mainly with stream ecology as it pertains to silver salmon and steelhead have appeared in professional scientific journals. He will be headquartered at Clackamas, the Commission's main research center.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, FEBRUARY 1963:

Item and Period	1963	1962	1961	1960	1959
..... (1,000 Lbs., Heads-Off)					
<u>Total landings, So. Atl. and Gulf States:</u>					
April	-	3,349	3,171	4,728	3,595
March	-	3,317	4,754	4,099	2,950
February	4,100	4,125	3,910	3,784	3,227
January	4,000	3,828	5,686	5,402	4,308
January-December	-	105,100	91,396	141,035	130,660
<u>Quantity canned, Gulf States^{1/}:</u>					
April	-	12	9	66	74
March	-	86	35	117	85
February	300	241	90	204	124
January	540	492	183	266	283
January-December	-	23,210	14,500	26,394	22,659
<u>Frozen inventories (as of end of each mo.)^{2/}:</u>					
April 30	-	15,637	27,492	20,502	23,331
March 31	-	16,607	31,345	23,232	24,893
February 28	3/	19,012	37,612	29,063	27,555
January 31	±29,263	21,328	37,842	34,332	30,858
January 1	31,577	28,372	40,913	37,866	32,844
<u>Imports^{5/}:</u>					
April	-	10,219	9,208	7,733	9,051
March	-	9,658	10,347	8,545	8,492
February	3/	10,599	8,932	7,657	7,481
January	13,139	12,907	12,338	8,596	8,238
January-December	-	141,384	126,268	113,418	106,555
..... (¢/lb., 26-30 Count, Heads-Off).					
<u>Ex-vessel price, all species, So. Atl. & Gulf Ports:</u>					
May	-	83.7	52.8	62.9	63.3
April	-	82.2	55.4	60.6	65.2
March	-	80.9	56.0	56.3	67.6
February	87-95	78.9	53.5	51.8	69.6
January	86-93	76.3	52.5	49.4	70.9
<u>Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:</u>					
May	-	96-103	67-69	74-77	70-76
April	-	94-97	69-70	74-75	75-82
March	-	94-95	69-71	65-68	81-83
February	102-106	93-95	69-71	65-67	82-87
January	102-106	91-94	69-71	64-66	86-88

^{1/}Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. (Data for canned shrimp beginning with February 1963 have been revised on the basis of a new conversion factor--30.3 lbs. per case. Data for January 1963 and preceding months were determined by multiplying the number of standard cases by 33.0 lbs. per case.)

^{2/}Raw headless only; excludes breaded, peeled and deveined, etc.

^{3/}Not available.

^{4/}Includes 397,000 pounds for firms not reported previously.

^{5/}Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

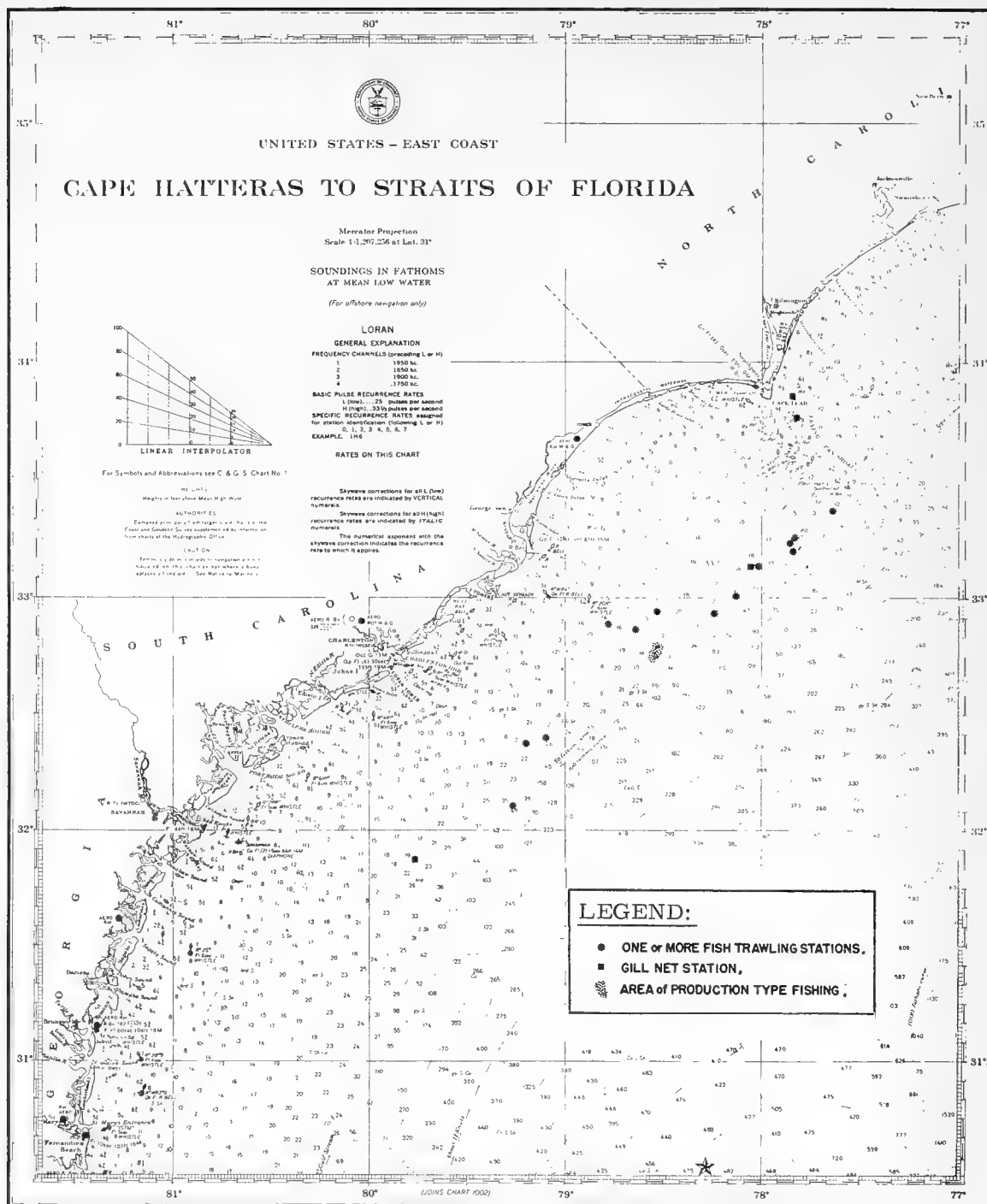
Note: Data for 1963 and 1962 are preliminary. February 1963 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



South Atlantic Exploratory Fishery Program

EXPLORATORY TRAWLING FOR COMMERCIAL SPECIES OFF NORTH AND SOUTH CAROLINA CONTINUED:

M/V "Silver Bay" Cruise 45 (January-February 1, 1963): The assessment of the seasonal availability to otter trawls of snap-



Shows the station pattern for cruise 45 of the M/V Silver Bay, January 15-February 1, 1963.

pers, groupers, and other commercially valuable species, was continued during an 18-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

Catches of commercial species off Cape Romain, S. C., in 14 to 24 fathoms ranged from 525 to 3,057 pounds per 90-minute drag. Best fishing was in 20 to 24 fathoms where 9 consecutive drags yielded a total marketable catch of 15,396 pounds of fish. Additional drags in 17 to 18 fathoms yielded catches of from 280 to 900 pounds of small (2 to 3 pound average) vermillion snapper (Rhomboplites aurorubens).

Scup (Stenotomus chrysops) averaging three to the pound dominated the catches off Southport, N. C. Best catches in that area were at depths of 17 to 18 fathoms, where they averaged over 1,000 pounds. Catches ranging from 260 to 2,000 pounds of scup were obtained from 90-minute drags.

Off Cape Romain, a roller-rigged 80/100-foot nylon fish trawl was fished with 10-foot bracket doors. Off Southport, a 70/90-foot nylon trawl was fished with 8-foot bracket doors and spacers rather than rollers on the footrope. Fishing was carried out mostly in daylight hours, and drags were made when whiteline recorder tracings indicated presence of fish.

In addition to trawling operations, three surface gillnet sets were made, with little success; and 370 sea-bed and 370 sea-surface drift bottles were released at 10-mile intervals in cooperation with personnel of the Bureau's Biological Laboratory at Beaufort, N. C.

Note: See Commercial Fisheries Review, October 1962 p. 30.

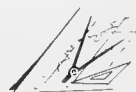


Storm Warnings

FASTER WARNINGS MADE POSSIBLE BY NEW COMPUTING DEVICE:

A storm radar data processor called STRADAP has been developed to replace time-consuming interpretation and transmission of radar storm data. The new electronic setup produces storm maps showing the intensity and height of a storm. The intensity of a storm is rated on a numbered scale of 1 to 7. Storm tops are shown on

another map scaled in units of 10,000 feet. It is planned to use STRADAP to transmit storm information from all parts of the country to a national center in less than 20 minutes. (Science News Letter, February 2, 1963.)



Tagging

RADIONUCLIDES OFFER POSSIBILITIES FOR FISH MARKING:

Fish marking possibilities using radionuclides are being studied by Atomic Energy Commission biologists at the Oak Ridge National Laboratory. The project involves collecting fish from the Clinch River, Tenn., above Watts Bar Reservoir, where they are exposed to low level radioactive wastes from the Laboratory.

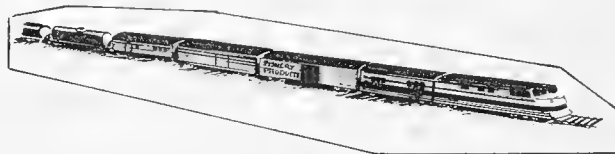
Radionuclides are accumulated by the fish either directly or through the food chain. Autoradiography of fish scales showed localized rings of radioactivity which presumably were associated with the fish's growth when they were in areas contaminated by radioactive wastes. The possibility appears that these rings may be used as a marking technique. The development of radionuclide tagging where fish would be marked without being handled, impaired, or injured could provide a means of study without altering fish behavior or growth.



Transportation

EASTERN RAILROADS SEEK INCREASED ICE AND SALT CHARGES:

The railroads in the Eastern territory have petitioned the Interstate Commerce Commission for permission to increase their charges for ice by $8\frac{1}{2}$ percent and their charges for



salt by 6 percent. The charges apply to shipments of fish and certain other products. The increase would raise the present cost of ice from \$6.91 per ton to \$7.50 a ton and the cost of salt from \$1.04 per cwt. to \$1.10 per cwt.

The railroads asked that the charges be increased immediately subject to a later investigation. If the entire increase is not ultimately approved, the railroads would voluntarily refund the excess collected in the interim.



United States Fisheries

FISH STICKS AND PORTIONS PRODUCTION, OCTOBER-DECEMBER 1962:

United States production of fish sticks amounted to about 19.0 million pounds and that of fish portions was 22.4 million pounds during the fourth quarter of 1962, according to preliminary data. This was a gain of nearly 5.1 percent in fish sticks and 26.2 percent in portions as compared with the same quarter of 1961.

Cooked fish sticks (17.5 million pounds) made up 92.3 percent of the fish stick total. The remaining 7.7 percent consisted of raw fish sticks. A total of 21.6 million pounds of breaded fish portions (of which 17.4 million pounds were raw) and 826,000 pounds of unbreaded portions were processed during the fourth quarter of 1962.

Plants on the Atlantic Coast produced the bulk of the fish sticks and portions--27.8 million pounds. The Gulf and Inland States produced 11.1 million pounds, and the Pacific Coast States, 2.4 million pounds.

During 1962, fish stick production of 71.7 million pounds was up 2.7 percent, and the fish portions production of 77.7 million pounds was up 29.8 percent as compared with 1961.

Table 1 - U.S. Production of Fish Sticks by Months and Type, October-December 1962^{1/}

Month	Cooked	Raw	Total
..... (1,000 Lbs.) . . .			
October	6,118	557	6,675
November	5,788	487	6,275
December	5,601	408	6,009
Total 4th Quarter 1962 ^{1/}	17,507	1,452	18,959
Total 4th Quarter 1961	16,834	1,205	18,039
Total 1962 ^{1/}	66,556	5,177	71,733
Total 1961	65,006	4,818	69,824

^{1/}Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, October-December 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . .	22	14,918	23	14,620
Inland & Gulf States . . .	5	2,368	7	1,934
Pacific Coast States . . .	10	1,673	9	1,485
Total	37	18,959	39	18,039

^{1/}Preliminary.

^{2/}Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1958-62

Month	1/1962	2/1961	1960	1959	1958
..... (1,000 Lbs.)					
January	6,104	6,091	5,511	6,277	5,471
February	6,859	7,092	6,542	6,352	5,925
March	7,706	7,233	7,844	5,604	5,526
April	5,480	5,599	4,871	4,717	4,855
May	5,609	5,129	3,707	4,407	4,229
June	5,058	4,928	4,369	4,583	4,702
July	3,613	3,575	3,691	3,790	4,574
August	5,696	6,927	5,013	3,879	4,358
September	6,506	5,206	5,424	5,353	5,328
October	6,675	6,133	6,560	5,842	5,485
November	6,275	6,288	6,281	4,831	5,091
December	6,009	5,618	5,329	4,743	5,467
Total	71,590	69,819	65,142	60,378	61,011

^{1/}Preliminary.

^{2/}Revised.

Table 4 - U. S. Production of Fish Portions by Months and Type, October-December 1962^{1/}

Month	Breaded			Un-breaded	Total
	Un-breaded	Raw	Total		
	..... (1,000 Lbs.)				
October	1,805	7,165	8,970	355	9,325
November	1,067	5,933	7,000	281	7,281
December	1,259	4,338	5,597	190	5,787
Tot. 4th Qtr. 1962 ^{1/}	4,131	17,436	21,567	826	22,393
Tot. 4th Qtr. 1961	3,518	13,564	17,082	657	17,739
Total 1962 ^{1/} ...	13,874	61,431	75,305	2,406	77,711
Total 1961 ...	11,003	46,783	57,786	2,061	59,847

^{1/}Preliminary.

Table 5 - Production of Fish Portions by Areas, October-December 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . .	23	12,930	24	9,870
Inland & Gulf States . . .	11	8,775	12	7,562
Pacific Coast States . . .	7	688	6	307
Total	41	22,393	42	17,739

^{1/}Preliminary.

^{2/}Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1962

Month	1/1962	2/1961	1960	1959	1958
..... (1,000 Lbs.)					
January	5,102	4,303	3,632	2,692	1,973
February	6,374	4,902	3,502	3,025	1,254
March	6,931	5,831	4,706	3,225	1,471
April	6,350	4,484	3,492	2,634	2,268
May	5,749	3,879	3,253	2,684	1,478
June	6,082	4,039	3,995	3,247	1,504
July	4,706	3,962	4,088	2,227	2,161
August	6,662	4,963	3,558	2,796	1,516
September	7,159	5,745	4,631	3,558	1,566
October	9,325	6,759	5,275	4,314	2,560
November	7,281	5,789	4,790	3,483	1,979
December	5,787	5,191	4,459	3,262	2,060
Total	77,508	59,847	49,381	37,147	21,790

^{1/}Preliminary.

^{2/}Revised.



U. S. Fishing Industry

LOANS TO FISHERY FIRMS:

Sixty loans totaling \$4.5 million have been made to fishery products processors by the Small Business Administration (SBA) of the U.S. Department of Commerce since enactment of the Small Business Act in 1953. In addition, SBA has made about 40 loans totaling \$2.8 million to wholesale and retail fish distributors.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JANUARY 1963:

Table 1 - U.S. Fishing Vessels ^{1/} -- Documentations Issued and Cancelled, by Areas, January 1963 with Comparisons			
Area (Home Port)	January		Total
	1963	1962	1962
Issued first documents ^{2/} :			
	... (Number) ...		
New England	1	2	28
Middle Atlantic	1	-	3
Chesapeake	-	4	43
South Atlantic	2	2	47
Gulf	12	10	110
Pacific	4	6	130
Great Lakes	-	-	5
Puerto Rico	-	-	2
Total	20	24	368
Removed from documentation ^{3/} :			
New England	1	2	24
Middle Atlantic	4	8	39
Chesapeake	1	2	23
South Atlantic	7	3	38
Gulf	5	13	104
Pacific	7	16	111
Great Lakes	2	5	22
Hawaii	-	1	3
Puerto Rico	-	-	1
Total	27	50	365

^{1/}For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels -- Documents Issued and Cancelled, by Tonnage Groups, January 1963		
Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
	... (Number) ...	
5-9	5	7
10-19	6	7
20-29	-	2
30-39	1	3
40-49	1	1
50-59	5	1
60-69	1	2
70-79	1	1
80-89	-	1
120-129	-	1
240-249	-	1
Total	20	27

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

^{2/}There were no redocumented vessels in January 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 1 in 1963; 12 in 1962; 1 in 1961; 1 in 1958; and 5 prior to 1951.

^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

During January 1963, a total of 20 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 24 in January 1962. There were 27 documents cancelled for fishing vessels in January 1963 as compared with 50 in January 1962.



U. S. Foreign Trade

TRENDS IN EXPORTS OF FISHERY PRODUCTS DURING 1961:

The total value of United States exports of fishery products in 1961 was 21.4 percent below the 1960 value--exports of edible fishery products were down 23.5 percent and exports of inedible fishery products were down 18.5 percent. The decline was mainly due to reduced exports of canned and frozen salmon, canned sardines, canned shrimp, unmanufactured shells, and fish oil. The decline was partly offset by greater exports of frozen shrimp and canned mackerel.

Table 1 - Value ^{1/} of United States Exports of Fishery Products, 1952-1961			
Year	Edible Products	Inedible Products	Total
	(US\$1,000)		
1961.	19,594	15,116	34,710
1960.	25,622	18,543	44,165
1959.	26,747	17,495	44,242
1958.	19,440	11,564	31,004
1957.	20,549	15,403	35,952
1956.	22,939	16,564	39,503
1955.	24,923	15,054	39,977
1954.	16,238	15,289	31,527
1953.	17,084	10,794	27,878
1952.	15,511	6,436	21,947

^{1/}Value at point of exportation.

Table 2 - Value ^{1/} of United States Exports of Fishery Products by Selected Commodities, 1957-61					
Commodity	1961	1960	1959	1958	1957
	(US\$1,000)				
Fish oils	8,908	10,688	11,902	7,761	10,760
Seal furs	3,097	3,309	2,580	1,511	2,455
Shells unmanufactured	1,380	2,636	977	624	775
Oysters, shucked	448	497	575	567	589
Salmon:					
Fresh or frozen	647	1,677	659	476	446
Cured	593	435	372	357	226
Canned	5,580	9,830	10,639	6,669	4,740
Mackerel, canned	581	211	135	333	2,146
Sardines:					
Canned, not in oil	1,336	3,443	5,843	3,231	2,654
Shrimp:					
Fresh or frozen	3,694	2,303	1,682	1,463	1,471
Canned	2,487	3,383	2,898	2,548	2,410
Squid, canned	353	691	906	501	2/
Miscellaneous fish:					
Fresh or frozen	809	947	622	1,036	973
Canned	391	355	326	496	2,137

^{1/}Value at point of exportation.

^{2/}Squid was included with "other shellfish" prior to 1958.

During 1961, United States fishery products were exported to 105 countries. Canada, the United Kingdom, Japan, Norway, and the

Netherlands (leading buyers of fishery products from the United States) accounted for 65.0 percent of the value of fishery exports (table 3). There was a substantial decline in exports to most leading markets except Canada, France, and Norway.

Table 3 - Value^{1/} of United States Exports of Fishery Products by Selected Countries of Destination, 1957-61

Country	1961	1960	1959	1958	1957
	(US\$1,000)				
United Kingdom.	4,554	8,460	8,928	5,785	3,708
Canada.	10,265	10,309	8,644	9,200	7,253
Philippines.	582	2,494	5,587	2,578	6,027
Netherlands.	2,385	4,350	4,352	2,007	2,969
Sweden.	1,665	2,613	3,176	681	1,844
West Germany.	1,555	2,201	2,888	3,043	5,099
Norway.	2,390	1,390	1,296	1,063	970
Japan.	2,984	3,295	928	501	669
Mexico.	459	616	663	393	175
Cuba.	-	175	787	490	721
Venezuela.	360	461	614	641	573
Belgium and Luxembourg.	351	537	746	948	447
France.	1,007	1,048	766	68	259
Switzerland.	738	1,082	762	387	463
Italy.	423	643	303	158	259
Greece.	364	313	306	136	195
Other countries.	4,628	4,178	3,496	2,925	4,321
Total.	34,710	44,165	44,242	31,004	35,952

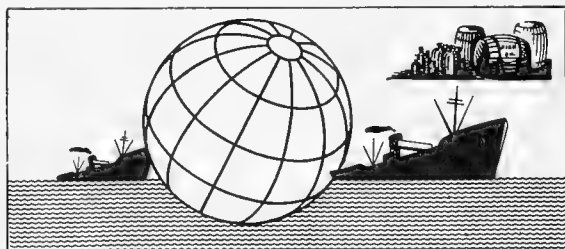
^{1/}Value at point of exportation.

Canada was the leading foreign market for United States fishery products in 1960 and 1961.

Table 4 - Value of United States Exports of Fishery Products to Canada, 1961

Fish and marine animal oils.	\$ 1,333,000
Seal furs.	1,777,000
Shrimp, fresh or frozen.	1,676,000
Shrimp, canned.	1,570,000
Salmon, canned.	918,000
Fish, fresh or frozen.	891,000
Oysters, shucked.	428,000
Other.	1,672,000
Total.	\$10,265,000

The United Kingdom ranked second as a buyer of United States fishery products, but the value of fishery exports to the United Kingdom in 1961 was down 46.1 percent from



that in 1960. The decline was mainly due to a drop in exports of frozen and canned salmon and canned shrimp. On the other hand, exports of fish oil to the United Kingdom became important for the first time in 1961.

Table 5 - Value of United States Exports of Fishery Products to the United Kingdom, 1961

Salmon, canned.	\$3,056,000
Shrimp, canned.	557,000
Salmon, fresh or frozen.	141,000
Fish and marine animal oils.	568,000
Other.	232,000
Total.	\$4,554,000

Exports to Norway, Sweden, West Germany, and the Netherlands consisted mainly of fish oils. The main products exported to Japan were frozen shrimp and unmanufactured shells. France bought frozen salmon, canned shellfish, seal furs, fish oils, and fish-liver oils.

Trend by Commodities: The principal fishery products exported by the United States in 1961 were fish oils, frozen shrimp, and canned salmon.

Fish Oil: In 1961, the value of exports of fish oil was noticeably less than in 1959 and 1960 in spite of the fact that the United States production during 1961 was the largest since 1939.

Canned salmon: In 1961, the value of exports of canned salmon was down 43.2 percent from 1960. The decline was partly due to a reduced domestic pack.

Shrimp: In 1961, the value of exports of frozen shrimp was 60.4 percent greater than in 1960, but the value of exports of canned shrimp was down 26.5 percent. Japan and Canada were the leading buyers of United States shrimp. (Does not include a substantial amount of re-exports, principally to Japan.)

Other Canned Fishery Products: In 1961, exports of canned sardines and canned squid declined to less than half their 1960 value. On the other hand, 1961 export shipments of canned mackerel and anchovies were about triple those of 1960.



Virginia

BIOLOGIST TO COLLECT FISH PARASITES FROM INDIAN OCEAN:

A biologist of the Virginia Institute of Marine Science, left March 1, 1963, for the Indian Ocean where he will collect fish parasites during the next three months. He will be a member of the first cruise of the International Indian Ocean Expedition. All expenses, including scientists' salaries, are being paid by the U. S. National Science Foundation.

The International Indian Ocean Expedition, sponsored by the United Nations Economic,

Scientific, and Cultural Organization (UNESCO), is a scientific endeavor primarily concerned with obtaining biological, chemical, geological, and physical information about land, ocean, and atmospheric conditions in the Indian Ocean area. At least 12 nations are participating in this important effort.

The biologist will participate in the first of 8 three-month cruises planned under the program. His work will be the collection of various fish species for a study of parasites. The project will aid in furthering worldwide studies of host-specificity of fish parasites.

The Virginia Institute Marine Laboratory has fish parasite collections from the western North Atlantic, Chesapeake Bay, Caribbean, Gulf of Mexico, Chile, New Zealand, Australia, and Antarctica. During recent years the Institute has been investigating a theory that fish parasites may act as natural tags and serve to indicate fish migrations.

* * * * *

STUDIES OF RADIOACTIVE WASTES IN BAY WATERS TO BE CONTINUED:

Studies on the role of filter feeding organisms in removing radioactive wastes from river and bay waters by scientists of the Virginia Institute of Marine Science are to be financed for the third consecutive year by a grant of \$20,000 from the Atomic Energy Commission.

The Virginia marine scientists were among the first to consider the role of living organisms in removing suspended radioactive particles from the water. Scientists earlier held that suspended materials would likely soon be flushed from the system by strong seaward currents. According to the Institute's scientists, their studies show that radionuclides become strongly attached to suspended silt and clay particles. During normal feeding, oysters filter out tiny living plankton organisms along with other suspended and non-living particles.

After filtration this material is mixed with a mucous substance and deposited in compacted clumps on the bottom. The problem of what happens to radionuclides associated with clay and silt particles included in this mass thereafter assumes great importance.

The scientists reported that although some of the radioactive material is incorporated into the oyster's flesh and shell or redissolved in the water, most of it remains on

the particles and is deposited in the bottom sediments. Much of this may subsequently be washed away by strong currents, but there is concern over amounts carried down into bottom layers by natural phenomena or by animals, such as worms, that live in bottom layers. When carried deep into the bottom by these organisms, the radioactive particles are no longer subject to transport by water movements.

In addition to oysters, the Virginia scientists will study removal of suspended particles by other filter feeders. Barnacles, clams, mussels, and tunicates (sea squirts) will be added to the 1963 phase of the project and silt particles will be "tagged" with a fluorescing dye to learn of their final disposition.

"Information provided by studies of this type are valuable in knowing what steps may have to be taken to preserve our valuable marine resources in the event of an accidental discharge of radioactive materials into the marine system," one of the Institute's scientists reported. "The increasing use of nuclear reactors by the military and in industry makes these investigations a growing phase of marine laboratory programs as we continue to adapt atomic energy for human progress."

Problems of possible radioactive contamination of various phases of the marine environment are but one facet of the ever increasing degradation to which natural waters are being subjected by the activities of man. Only by acquisition of adequately detailed scientific knowledge will it be possible to minimize destruction of this resource which is so important to society.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in February this year dropped 2.9 percent from January 1963 due primarily to lower ex-vessel prices for fresh drawn haddock and a drop in prices for fresh haddock fillets and frozen dressed halibut. Supplies of groundfish landed at New England ports began to improve in late winter, and stocks of frozen dressed halibut from the 1962 Pacific fishing season were higher than normal. Compared with the same month a year ago, wholesale prices for fishery products this February were lower by 1.1 percent due mainly to lower first hand prices for fresh haddock fillets and canned fish products.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Feb. 1963	Jan. 1963	Feb. 1963	Jan. 1963	Dec. 1962	Feb. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					118.4	121.9	120.9	119.7
Fresh & Frozen Fishery Products:					124.4	130.0	127.6	118.5
Drawn, Dressed, or Whole Finfish:					122.7	137.2	133.1	118.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.21	94.6	162.9	143.8	107.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.43	.43	125.6	128.1	127.1	117.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.96	.96	133.8	134.5	135.2	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.68	.71	100.7	106.0	103.0	115.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.69	.54	113.0	88.5	88.5	120.4
Processed, Fresh (Fish & Shellfish):					128.5	130.4	128.5	125.4
Filletts, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.57	98.3	137.2	139.6	109.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.12	1.09	130.7	127.2	123.1	123.1
Oysters, shucked, standards	Norfolk	gal.	7.75	7.88	130.7	132.8	132.8	130.7
Processed, Frozen (Fish & Shellfish):					117.3	117.5	116.4	107.7
Filletts: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	98.9	100.1	100.1	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	108.5	107.0	107.0	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.34	115.7	117.5	117.5	119.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.04	1.05	123.4	123.9	122.2	112.1
Canned Fishery Products:					108.0	108.0	109.4	122.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.75	24.75	107.9	107.9	111.1	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.90	5.90	2/100.0	2/100.0	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.31	119.4	119.4	119.4	164.3
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								
2/One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced in the fishery products index by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.								
3/Based on Calif. sardines and not directly comparable with new subgroup item (jack mackerel) for January-February 1963 and December 1962.								

The drawn, dressed, and whole finfish subgroup index in February 1963 was down 11.6 percent from a month earlier, but was up (3.5 percent) from February a year ago. Much lower ex-vessel prices at Boston for fresh drawn haddock were largely responsible for the decrease from January to February this year. In addition, some weakness developed in the wholesale market for frozen dressed halibut (down 2.0 percent). From February a year ago to February this year, a decrease of 12.0 percent in the drawn fresh haddock price was more than compensated for by increases in prices for frozen dressed halibut (up 7.1 percent) and frozen dressed salmon (up 11.0 percent). Changes in fresh-water fish (whitefish and yellow pike) wholesale price indexes for January and February 1963 as compared with February 1962 were not significant due to the lack of regular supplies.

The fresh processed fish and shellfish subgroup index this February decreased 1.5 percent from a month earlier, but was up 2.5 percent from February 1962. A decrease of 28.4 percent (dropped about 16 cents a pound) in the fresh haddock fillet price at Boston plus a slightly lower fresh shucked oyster price was offset partially by a 2.8 percent increase in the fresh shrimp price at New York City. As compared with February 1962, haddock fillets this month

were down 10.1 percent, but fresh shrimp prices were higher by 6.2 percent. The fresh shucked oyster price was unchanged from February a year ago to this February.

The February 1963 processed frozen fish and shellfish subgroup price index dropped slightly (less than 1/2 percent) from the preceding month because of a one-cent-a-pound decrease in the price for frozen shrimp at Chicago, plus declines of about 1/2 cent a pound in the wholesale prices for frozen flounder and ocean perch fillets. During the same period frozen haddock fillet prices increased 1.4 percent (1/2 cent a pound). Compared with the same month a year ago, the February 1963 subgroup index rose 8.9 percent due to higher frozen shrimp prices at Chicago (up 10.0 percent), but with slightly lower prices for frozen ocean perch and flounder fillets.

The canned fishery products subgroup index was unchanged from January to February 1963 and remained at 108.0 percent of the 1957-59 base. From February a year ago to this February, the subgroup index dropped 11.5 percent because of a sharply lower canned Maine sardine price (down 27.3 percent), a lower canned pink salmon price (down 13.1 percent), and a 3.3 percent drop in the canned tuna price.





International

EUROPEAN FREE TRADE ASSOCIATION

ACCELERATED TARIFF CUTS PLANNED:

Ministers representing the European Free Trade Association (EFTA) countries (Austria, Britain, Denmark, Norway, Portugal, Sweden and Switzerland) met in Geneva, Switzerland, on February 18-19, 1963. They called for a detailed plan to abolish intra-EFTA tariffs and quotas on industrial products at an accelerated rate by 1966. Britain asked for 1965 as the target date.

Trade in agriculture and fish pose special problems, particularly to Norway and Denmark. (*British Record*, March 5, 1963.)

FISH MEAL

FISH MEAL PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-NOVEMBER 1962:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Production and Exports of Fish Meal by Member Countries of the Fish Meal Exporters' Organization, Jan.-Nov. 1962				
Country	Nov. 1962		Jan.-Nov. 1962	
	Production	Exports	Production	Exports
	..... (Metric Tons)			
Angola	4,375	3,434	29,041	28,663
Iceland	1,218	4,421	93,980	63,433
Norway	9,131	10,221	116,370	51,303
Peru	145,543	94,466	964,881	958,331
South Africa (incl. S. W. Africa) ..	800	9,680	201,219	181,641
Total	161,067	122,222	1,405,491	1,283,371

In January-November 1962, Peru accounted for 74.7 percent of total fish meal exports by FEO countries, followed by South Africa with 14.2 percent, Iceland with 4.9 percent, Norway with 4.0 percent, and Angola with 2.2 percent. (Regional Fisheries

Attache for Europe, United States Embassy, Copenhagen, February 6, 1963.)

FISH MEAL AND OIL

EUROPEAN MARKET TRENDS, FEBRUARY 1963:

The European fish oil market was quite firm with further price advances possible in early February this year according to Danish fish oil brokers. Current sales prices in U.S. currency were:

Danish herring oil for summer delivery--\$123 per metric ton (5.58 cents per pound) c.i.f. German and Scandinavian ports.

U. S. menhaden oil for Feb./Apr. delivery--\$116 per metric ton (5.26 cents per pound) c.i.f. Rotterdam.

Peruvian semi-refined anchovy oil for April-July delivery--\$120 per metric ton (5.44 cents per pound) c.i.f. Rotterdam.

Some Icelandic herring oil was reported sold for summer delivery at \$127 per metric ton (5.76 cents per pound) c.i.f. European ports, but it seems to be primarily an asking price. One holder of current stocks of Icelandic oil is waiting for a price of \$141.50 (6.42 cents per pound).

Late in February 1962, Danish brokers stated that the European fish-oil market continued to be firm with few offerings. The same sources also stated that there were indications that some stocks were being held for higher prices. A late February sale of menhaden oil at US\$128 a metric ton (5.81 cents a pound) c.i.f. Scandinavian ports, according to above sources, was below the market, which was nearer the \$132-133 (6.00-6.03 cents a pound) level. The Danish sources feel that the 1963 level of fish-oil prices will be determined by sales of the 1962/63 Antarctic whale-oil production to a large United Kingdom buyer.

International (Contd.):

The European market for fish meal was weak late in February and, according to Danish brokers, was unaffected by labor troubles in Peru. Fish-meal brokers in Holland, West Germany, and the United Kingdom confirmed this view of the fish-meal market. A late February sale in the United Kingdom was made at \$131.60 a long ton c.i.f. (\$117.50 a short ton) and fish meal was offered for October 1963-June 1964 delivery at \$130.90 a long ton c.i.f. (\$116.88 a short ton). (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 6 and 25, 1963.)

FOOD AND AGRICULTURE ORGANIZATION

FISHERIES DIRECTOR TALKS ON WORLD FISHERIES DEVELOPMENTS:

The control of stocks of commercially valuable sea fish, the transplanting of fish from the northern to the southern hemisphere, and a forecast of at least doubling the present harvest from the sea in the coming 2 or 3 decades, were some of the prophecies made in a speech by the Director of the Fisheries Division of the Food and Agriculture Organization (FAO). His speech was given at the annual dinner of the Newfoundland Board of Trade at St. John's, Canada.

After tracing the changes in fisheries during the past 40 years, the Fisheries Division Director stated:

"One thing that is basic to such consideration is simply this: fishing is still a hunting operation. Beyond the territorial waters, whatever they may be, it is first come, first served, and devil take the hindmost. I am confident that some day this will change; there are already signs of it coming. For example, the "abstention principle" which is a feature of the North Pacific Fisheries Treaty. But it is my opinion that many years will pass before humankind will be able to achieve such an equity. In the meantime it will be up to nations, while doing their utmost to bring about a more reasonable regime, to adjust themselves to things as they are and to keep up with changes."

On the catching side, he said, there will be continued improvement in the efficiencies of boats and gear and fish finding operations. The use of very high frequencies in echo sounders and ASDIC are already making it possible to locate a single fish half a mile away. Moreover, it is possible to identify the kind of fish giving the echo.

"I think that the time may come when certain species of marine fish will be attracted by some means--for example by light, sound or fenced in by electric impulses or screens of air bubbles--and pumped from the sea," he continued. "Actually this is already being done experimentally by the Soviets. The Germans are doing considerable work with electric impulses. This

works quite well in fresh water, but much more will have to be discovered before the technique can be made economical in sea water. New lightweight, non-deteriorating synthetic fibers will be used in knotless nets. The introduction of transducers into trawls themselves will make trawling a much less chancy operation. The continued study of fish behavior in the ocean will make them easier to catch. Much work in this field is being done by the U.S.S.R., Japan, Canada, and the U.S.A."

The design of new hull shapes will increase stability and safety, and propulsion efficiencies and new mechanized hauling will make it quicker and easier to haul the gear. The amount of capital employed in the floating equipment will tend to move upwards and fisheries are moving away from the "cottage industry" stage to the capitalized industry stage.

He went on to say: "There is another realm of progress which as yet is barely started, and that is fish culture. Coastal oyster culture is well known in many lands. Recently FAO through the Expanded Program of Technical Assistance, has started pearl shell culture in the Red Sea. There are many examples in the Far East and Australia of the culturing of the oyster which yields pearls. All these are true underwater farming operations. But I am not so much concerned with this as with the really exciting work which has been going on, for example, at Lowestoft, in England, on the plaice.

"The female plaice lays its eggs by the hundreds of thousands. But the natural mortality of the young larvae plaice is so great in the first few weeks that less than one thousandth of one percent survive. After this period the chances of survival are better. The English biologists thought that if they could protect the young larvae for from 6 to 8 weeks and get them over the initial critical period, it would greatly increase the yield.

"After many trials and many failures, it seems that they have succeeded. Survival can now be increased to well over 30 percent and possibly more. It does not take much imagination to see what this might lead to: a plaice hatchery on the inlet of the sea, an inlet which could be closed at will; the nurturing of the young fish initially in the hatchery and subsequently in the inlet itself, the waters of which might be fertilized; the subsequent transplantation of the young fish to the natural banks. Biologists are of the opinion that this might at least quadruple the yield of the fishery if proper agreements could be made among the different countries fishing."

Another example he cited is the recent success of a fishery scientist, under FAO Technical Assistance, in breeding the giant fresh water shrimp in Malaya.

Another development is the transplantation of fish. An example is the recent Soviet success in transplanting pink salmon from Siberia to the Baltic which may result in an entirely new fishery.

"Many of the fish that swim in the Northern Hemisphere are permanently barred from the Southern Hemisphere by the belt of high temperature equatorial waters," said the Director. "Some of these might be transplanted by man with the probable result of increased production. An example of this is the transfer of trouts and salmons from the Northern Hemisphere to New Zealand in the Southern Hemisphere. New Zealand has become famous for this and is a mecca for

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sports fishermen. The ample presence of fish food has led to phenomenal growth in the trouts themselves. Thirty- or forty-pound trouts are not unusual.

"Another thing which I am fairly certain will take place is that man will eat many more kinds of fish than he does now," he continued. "In the Northern Hemisphere the kinds of fish consumed by man are relatively few. There are many kinds which he does not eat. Often a change in the name of a fish will bring about a demand for it. Ocean perch is an example. In Denmark a demand is being created for filleted dogfish by calling it a different name. I think in the future man will eat them without knowing what he eats. This will come about by introducing changes in product form. For example, many countries have followed the Japanese lead in the manufacture of fish sausages. The Japanese have over a hundred ways of diversifying their products."

There will also be an increase in the use of aquatic plants, perhaps not so much in direct consumption as in food producing industries and in agriculture. There are millions of tons of aquatic plants available.

The Director continued with "The obvious support for believing in increased yields is that certain seas are abundant in fish that are not being caught. Take the Arabian Sea and Indian Ocean, for example. A few years ago a Soviet hydrographic vessel reported steaming for hour after hour in that area through dead floating fish of the mackerel type. It is estimated that there were hundreds of tons of fish. Apparently there are deep layers of water in these seas that contain little, if any, free oxygen. Sometimes these layers are brought to the surface by huge upwellings and fish die of suffocation. There is no doubt that the fish are there. But, as far as we can find out, there is no attempt to fish these waters. The result is a huge, untapped resource.

"All this adds up to the increased production of sea fish. . . . Within the next 20 or 30 years I think that harvests from the sea will be at least doubled."

In 1961 about one quarter of the world catch of more than 40 million tons of fish went into fish meal. Today the figure may be slightly more. Fish meal is used in feeding livestock and there is a growing demand for it. A new idea is to manufacture fish meal from fresh material under sanitary and hygienic conditions to prepare a wholesome protein concentrate for human consumption. Africa, India, and South Asian countries are examples where this material is used in fish soups and curries, etc., and supplements predominant carbohydrate diets.

"FAO, the Fish Meal Association, and the United Nations Children's Fund (UNICEF) are cooperating in this under the Freedom from Hunger Campaign," he stated. "It is my opinion that large new markets can be opened up for the new product with the consequent increase in consumption of animal protein of high quality."

* * * * *

FIRST MEETING OF ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH:

The recently established Advisory Committee on Marine Resources Research of

the Food and Agriculture Organization (FAO) met for the first time in Rome on January 28, 1963. The week-long meeting opened with an address by the Deputy Director-General of FAO who pointed out that: "The growth and expansion of highly industrialized sea fisheries are having an increasing impact on the living natural resources on which they depend. At the same time they are leading to an intensified search for new resources. Both these factors reinforce the needs for scientific study of all such resources as a basis for their wise and efficient use." The phrase "wise and efficient use," he said, meant not only the conservation and improvement of present world fish stocks, but also the application of modern scientific knowledge about the biology of fish and their environment "in such a way as to improve catching techniques and fishing operations generally."

Following the Deputy Director-General's address, Dr. A. W. H. Needler, Director, Fisheries Research Board of Canada, was elected Chairman of the Advisory Committee. The two Vice Chairmen elected were Dr. Cyril Lucas, Director of the Marine Laboratory of the Department of Agriculture and Fisheries for Scotland, and Professor Michitaka Uda of the Tokyo University Department of Fisheries.

The Advisory Committee will review FAO's present work in marine resources research and will discuss the research program planned for 1964-1965. (Food and Agriculture Organization of the United Nations, Rome, January 29, 1963.)

Note: See Commercial Fisheries Review, April 1962 p. 65, February 1962 p. 54.

INTERNATIONAL NORTH PACIFIC
FUR SEAL COMMISSION

PROTOCOL TO AMEND INTERIM CONVENTION DRAFTED AT CONFERENCE:

The representatives of the Governments of Canada, Japan, the Union of Soviet Socialist Republics, and the United States, the Parties to the Interim Convention on Conservation of North Pacific Fur Seals of 1957, met at the Ministry of Foreign Affairs in Tokyo, Japan, from February 18 to March 1, 1963, in accordance with the provisions of the Convention.

The purpose of the Conference was to consider the recommendations of the Commission made in accordance with the Convention and to determine what further agreements might be desirable in order to achieve the

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maximum sustainable productivity of the North Pacific fur-seal herds.

The Conference adopted a report to the Governments of the Contracting Parties recommending that they amend the present Interim Convention by concluding a protocol conforming to a draft which has been agreed to at the Conference.

If all of the four Governments, after reviewing it, agree to the draft protocol, it will be opened for signature by the four Governments in Washington, D. C.

The text of the draft protocol follows:

The Governments of Canada, Japan, the Union of Soviet Socialist Republics, and the United States of America, Parties to the Interim Convention on Conservation of North Pacific Fur Seals, signed at Washington on February 9, 1957, hereinafter referred to as the Convention,

Having given due consideration to the recommendations adopted by the North Pacific Fur Seal Commission on November 30, 1962, and

Desiring to amend the Convention,

Have agreed as follows:

Article I

The Convention shall be amended by this Protocol as from the date of its entry into force.

Article II

1. After Article II, paragraph 2(f) of the Convention, the following shall be inserted:

"(g) effectiveness of each method of sealing from the viewpoint of management and rational utilization of fur seal resources for conservation purposes;

(h) quality of sealskins by sex, age, and time and method of sealing; and."

2. In Article II, paragraph 2 of the Convention, "and" at the end of sub-paragraph (f) shall be deleted and "(g)" shall be replaced by "(i)".

Article III

Article II, paragraph 3 of the Convention shall be replaced by the following:

"3. In furtherance of the research referred to in this Article, the Parties agree:

(a) to continue to mark adequate numbers of pups;

(b) to devote to pelagic research an effort similar in extent to that expended in recent years, provided that this shall not involve the taking of more than 2,500 seals in the Eastern and more than 2,200 seals in the Western Pacific Ocean, unless the Commission, pursuant to Article V, paragraph 3, shall decide otherwise; and

(c) to carry out the determinations made by the Commission pursuant to Article V, paragraph 3."

Article IV

In Article III of the Convention, "and the Schedule" shall be deleted.

Article V

Article V, paragraph 2(e) of the Convention shall be replaced by the following:

"(e) study whether or not pelagic sealing in conjunction with land sealing could be permitted in certain circumstances without adversely affecting achievement of the objectives of this Convention, and make recommendations thereon to the Parties at the end of the eleventh year after entry into force of this Convention and, if the Convention is continued under the provisions of Article XIII, paragraph 4, at a later year; this later year shall be fixed by the Parties at the meeting early in the twelfth year provided for in Article XI."

Article VI

Article V, paragraph 3 of the Convention shall be replaced by the following:

"In addition to the duties specified in paragraph 2 of this Article, the Commission shall, subject to Article II, paragraph 3, determine from time to time the numbers of seals to be marked on the rookery islands, and the total number of seals which shall be taken at sea for research purposes, the times at which such seals shall be taken and the areas in which they shall be taken, as well as the number to be taken by each Party."

Article VII

In Article VIII, paragraph 2 of the Convention, "the Schedule" shall be replaced by "Article II, paragraph 3."

Article VIII

Article IX, paragraph 3 of the Convention shall be replaced by the following:

"3. In order more equitably to divide the direct and indirect costs of pelagic research in the Western Pacific Ocean, it is agreed that Canada and Japan for three years starting from the seventh year after entry into force of this Convention will forego the delivery of the sealskins by the Union of Soviet Socialist Republics as set forth in paragraph 1 of this Article and the Union of Soviet Socialist Republics will deliver annually to Canada and to Japan 1,500 sealskins each during these three years."

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Article IX

1. In Article XI and Article XIII, paragraph 4 of the Convention, "sixth" shall be replaced by "twelfth".
2. In Article XIII, paragraph 4 of the Convention, "six" shall be replaced by "twelve".

Article X

The Schedule annexed to the Convention shall be deleted.

Article XI

1. This Protocol shall be ratified and the instruments of ratification deposited with the Government of the United States of America as soon as practicable.
2. The Government of the United States of America shall notify the other signatory Governments of ratifications deposited.
3. This Protocol shall enter into force on October 14, 1963, if the fourth instrument of ratification is deposited on or before that date, and if the fourth instrument of ratification is deposited after October 14, 1963, on the date of its deposit.
4. Notwithstanding Article I of this Protocol:
 - (a) if this Protocol has not entered into force on or before January 31, 1964, the Convention shall apply with respect to pelagic research for the seventh year.
 - (b) even if this Protocol has entered into force after the beginning of the commercial sealing season of the seventh year, Article IX, paragraph 3 as amended by this Protocol shall apply with respect to the said season.
5. The original of this Protocol shall be deposited with the Government of the United States of America, which shall communicate certified copies thereof to each of the Governments signatory to this Protocol.

Note: See *Commercial Fisheries Review*, January 1963 pp. 72 and 74, May 1962 p. 41, and April 1957 p. 33.

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

JAPAN-SOVIET FISHERIES CONFERENCE DATE SET:

The International Northwest Pacific Fisheries Commission (Soviet Union and Japan) were scheduled to hold a series of meetings beginning March 4, 1963. The Commission sets the annual Soviet and Japanese catch quota for salmon and king crab in the Northwest Pacific Ocean. (United States Embassy, Tokyo, January 9, 1963.)



UNITED NATIONS CONFERENCE ON THE APPLICATION OF SCIENCE AND TECHNOLOGY FOR THE BENEFIT OF LESS DEVELOPED AREAS

FISHERY DEVELOPMENT PLANS PROPOSED BY U. S. SCIENTISTS:

Two long-range plans under which emerging nations can convert the unused protein in their coastal waters into food for their hungry were submitted by United States scientists to be incorporated into the proceedings of the February 1962 Conference on the Application of Science and Technology to Less-Developed Areas, held in Geneva, Switzerland.

One plan in the papers submitted for publication pointed the way for the development of fisheries along traditional lines to supply needed protein and to meet the individual tastes for fresh, dried, or canned fish. Another plan showed the possibilities of developing a highly acceptable fish protein concentrate to supply the animal protein needs of those whose diets are lacking in this nutrient. The separate plans would not be in conflict, but would supplement each other--taking into account problems of food distribution and traditional forms of food preparation.

The scientists based their programs upon the proposition that the sea, acre for acre, is potentially as productive as the land; that only about 16 percent of this potential is being harvested; that only about one-fifth of the world's harvest of fish is available to the people in the areas where the shortage of animal protein is most acute.

The plans were prefaced by a review of conditions in many parts of the world. Peru has increased its fish harvest 600-fold in the past 15 years. West Africa has areas in which peoples, a few miles from the coast, are suffering from lack of proper food while the coastal waters teem with protein-packed fish. India has a shortage of harbors which hampers fish landings. There are also social customs there which frown upon the use of fish as food. In many areas, hot weather and poor transportation facilities have erected an impassable barrier to utilization and distribution of fishery resources actually only a few miles away.

The first plan called for a balanced, concurrent development of production, processing and distribution, all of which must necessarily be in accord with the economic,

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technological and social progress of the respective nations. The scientists emphasize any fishery development must be tied closely to the existing base--human skills and industrial facilities. They noted the undesirability of producing more fish than the industry can properly process and distribute; that it would be of no purpose to introduce fishing gear which exceeds the capacity of the available vessels or the present skills of the available workers, and that national customs must be taken into consideration.

According to the United States scientists, the development of these traditional fisheries could well cover a period of ten years or more. The program would include analysis of the economic, social, and religious barriers to fishery development. It would recognize the need for biological, technological, economic and engineering skills for the optimum development of the fishery resource, and it would also begin with the facilities and fishermen at hand and attempt to achieve better utilization of the present facilities by training the fishermen, by making improvements in the lines and nets being used, and by converting to more efficient equipment and methods when the demand increases, skills develop, and processing and marketing methods improve.

The second plan explained how time, temperature and transportation categories, which offer serious problems in the development of the traditional fisheries in certain parts of the world, can be obviated, to a great extent, by the development of a highly desirable fish protein concentrate.

More than 20 nations are interested in the search for a satisfactory fish protein concentrate. The Canadians have developed a product of exceptionally high nutritive quality and several United States industries have developed products which are now under test. The Union of South Africa has developed and tested a concentrate. The United Nations has actively cooperated with the Chilean Government in a pilot plant operation. Researchers in Uruguay, Morocco, India, Russia, Norway, Sweden, Denmark, and Britain, are actively seeking ways and means for preparing the most acceptable concentrate.

The United States Government contemplates an extensive review of the problems

associated with the manufacture of, and use of the concentrate.

Fish protein concentrate will not eliminate the problems of time, temperature and transportation but it will reduce them to a great extent. There will be problems on packaging, marketing, and consumer education, but those problems would be far less challenging than those encountered in expanding the utilization of existing types of traditional fishery products.

This is not to say, the scientists pointed out, that the development of a suitable fish protein would replace other methods of processing for the individual taste remains a potent factor in the market. But with both these plans in operation, such important objectives as expansion of the over-all market for fishery products expansion of the world's fishing effort, and the extension of the dietary benefits of marine resources to nutritionally deficient population groups can be achieved.

A third phase of fishery resource development discussed was the effect industrialization was having upon the fisheries of the older nations. It was pointed out that in America, development proceeded in steps associated with technological advances affecting vessels, fishing methods, techniques of preservation, and facilities for transporting, storing and marketing. Where American fisheries have been slow to develop, the principal retarding influence has been ignorance about the resource, about its possible use, or about techniques for developing it.

The stimulus of science and technology has had both good and bad effects upon the fisheries in the United States. Disposal of chemical wastes into fishery habitat and the blocking of migration streams by huge dams have had injurious effects. On the other hand, such developments as the aqualung has led to intensive biological studies of underwater habitat and to the development of new fisheries through the creation of artificial reefs.

The industries which have made the great modern fisheries are based upon such things as the manufacture of fish meal, oil and solubles, canning, and refrigeration. The increased demand for raw material for the fish-processing industries has stimulated improvements in vessels, vessel equipment, fishing gear and techniques, extension of the

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range of fishing, and general improvements in operations.

Industrialization has also resulted in a tremendous increase in the number of persons fishing for recreation, or for food for their personal use.

Scientists who participated in the preparation of the presentations to the conference included representatives from the U. S. Department of the Interior's Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife, University of Washington, Seattle, Wash., and research and scientific organizations.



Australia

ABALONE EXPORTS TO HONG KONG PLANNED:

A firm in Tasmania planned to ship about 2,000 pounds of frozen abalone to Hong Kong during early 1963 in an effort to develop a new export market. The abalone consignment to Hong Kong will be marketed as a low-priced product. The Tasmanian firm was also conducting experiments in drying abalone for export. The manager of the firm said that good quality abalone were plentiful in Tasmanian waters. The firm employed two skin divers equipped with aqualungs to harvest them.

Several years ago, an attempt to develop a market for abalone in Sydney, Australia, proved unprofitable. (Fish Trades Review, Australia, December 1962.)

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ANOTHER TUNA FREEZING AND CANNING VENTURE PLANNED:

Following harbor improvements, the New South Wales port of Ulladulla (located about 100 miles south of Sydney) hopes to develop a £500,000 (US\$1,122,000) tuna-fishing industry. The Ulladulla's fishermen's Cooperative believes that in addition to tuna canning that the whole frozen tuna can be sold profitably in the export market. As a step towards developing a tuna-processing industry, the Cooperative has set up a cannery in the nearby town of Milton. One of the Co-

operative's officers is reported to have pioneered canning at Eden some years ago. (Fish Trades Review, December 1962.)

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RESEARCH ON TUNA AND AUSTRALIAN SALMON AIDED BY TAGGING:

Intensive fish-tagging programs on tuna and salmon are being carried out by Australia's Division of Fisheries and Oceanography. The Division's target is to tag 15,000 tuna and 50,000 salmon in 1963 and 1964. The tagging technique is used to gain information on rates of growth, distribution, and movement of the fish.

During the past five years, 7,000 tuna have been tagged of which 108 have been recovered.

In the past, most fish tagged have been caught from vessels owned by the Division or under charter. In 1963, the scientists will work with the fishing fleet and will tag fish caught during commercial fishing operations. Fishermen will be paid the ruling market price for fish which the scientists tag and release.

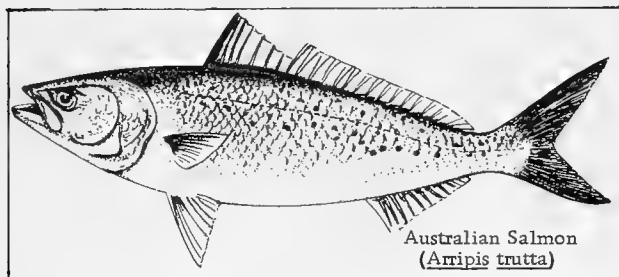
Most tuna fishermen are familiar with the red spaghetti or streamer-type tag used to tag tuna. Some tags now have a yellow tip, which indicates that fish have also been given an injection of harmless terramycin which makes the bones fluorescent. This technique was first tried in Australia in tuna-tagging operations carried out from the chartered vessel Estelle Star in Western Australia in 1962. A number of fish which were injected have been recaptured, and autopsies have shown that while the injection produces a marked local lesion in the muscle tissue at the injection site, this lesion had almost disappeared within four weeks. All calcified structures in the recaptured fish which have been examined show yellow fluorescence in ultra-violet light. The fluorescence is strongest in the outer layers of bone structures. Scales, though small and thin, produce a fluorescence visible to the naked eye.

This "marking" of calcium structures at the time of tagging will greatly assist scientists to measure the growth between tagging and recapture, and aid in determining the age of the fish.

In the last 15 years, the Fisheries Division has tagged 11,783 Australian salmon

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(*Arripis trutta*) of which 1,212 have been recaptured. The internal-type tag is being used to tag the Australian salmon.



Australian Salmon
(*Arripis trutta*)

One of the present "mysteries" of Australian salmon is whether the fish move out to sea or stay near the coast the whole of the time. If they do move out to sea, the commercial fishermen may be fishing only the fringe of the population, and discovery of the seaward distribution could lead to a considerable expansion of the fishery. An intensive tagging program, particularly tagging of juvenile fish, may give the scientists some of the clues they need to answer the question whether there is a seaward distribution.

The Australian scientists hope to be able to arrange with commercial fishermen to purchase live salmon which they will tag and release. In addition, a scientific team will work in the estuaries of northern Tasmania to tag young fish. (Fisheries Newsletter, December 1963.)

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FISH FREEZING PLANT ON NORFOLK ISLAND PROPOSED:

A plant to freeze fish, and possibly vegetables, may be established on Norfolk Island off the East Coast of Australia by a firm that distributes dairy products in the Australian State of Queensland. The firm's plan was announced in December 1962 and includes the possibility of financial assistance to vessel owners in Norfolk Island in order to insure a steady supply of fish to the proposed freezing plant. The freezing plant would aid the depressed economy of Norfolk Island, which is an Australian territory. (Pacific Islands Monthly, January 1963.)

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RECOMMENDATIONS FOR MANAGEMENT OF SPINY LOBSTER FISHERY ADOPTED:

Management of the southern spiny lobster (crayfish) was discussed in Melbourne, November 27-28, 1962, by a special meeting of Australian Commonwealth and State fishery officers, as recommended by the Commonwealth State Fisheries Conference in September 1962 and approved at a meeting of Australian Ministers responsible for fisheries.

Represented at the Melbourne meeting were the following fisheries authorities: Commonwealth--Department of Primary Industry and Commonwealth Scientific and Industrial Research Organization (CSIRO); States--South Australia, Victoria, Tasmania, and New South Wales.

The conference adopted the following recommendations to the Governments concerned:

Legal minimum length of female crayfish to be reduced from $4\frac{1}{4}$ inches to $3\frac{3}{4}$ inches, the legal length of male crayfish to remain at $4\frac{1}{4}$ inches.

Following scientific evidence from CSIRO, the only closed seasons should be:

1. Male crayfish: Closed season from September 1-October 31 for Tasmania (except the King Island area), Victoria, South Australia, New South Wales, and extra-territorial waters. A closed season for male crayfish in the King Island area from December 15-January 31.

2. Female crayfish: Closed season from June 1-October 31 for Tasmania, Victoria, South Australia, New South Wales, and extra-territorial waters.

States and Commonwealth to adopt a carapace measurement from the mid-point of the anterior dorsal edge to the mid-point of the posterior dorsal edge along the median line of the carapace. If this recommendation is adopted, the recommended legal length will have to be adjusted. (Fisheries Newsletter, January 1963.)

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SHRIMP FISHERY IN SHARK BAY BEING DEVELOPED:

Another shrimp fishing project for Shark Bay, which is located about midway on Western Australia's coast, has

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been announced by the managing director of a Fremantle company. The company plans to handle between 600,000 and 800,000 pounds of shrimp each season.

The company has been granted five licenses to fish for shrimp in the Shark Bay area. It will use five freezer vessels which it has available, but the shrimp will be processed in a new factory to be built at Shark Bay. An automatic machine will peel, devein, grade, and pack the shrimp ready for freezing. Refrigerated trucks will carry the processed shrimp some 600 miles to Fremantle for exporting.

In addition to the new shrimp processing plant at Shark Bay, the company plans to build a cafe, general store, and garage, and to supply Shark Bay township with electric power.

A second company has been granted 10 shrimp fishing licenses for Shark Bay. The company commenced fishing there in May 1962, using three vessels.

Ten shrimp fishing licenses have also been granted to individual vessel owners, making a total of 25 for Shark Bay.

In July last year, the Western Australian Minister for Fisheries announced restrictions on shrimp fishing in the Shark Bay-Carnarvon area. He said he had directed that no shrimp trawler from the eastern States should be issued a license unless it was purchased by, or brought under charter to, an approved local fisherman.

He also issued instructions that no local craft not already operating could enter the fishery in that area without prior approval from the Department. This was done, not only to safeguard the fishery against over-exploitation, but also to protect the fishermen themselves. (*Australian Fisheries Newsletter*, January 1963.)

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SHRIMP PROCESSORS SURVEY UNITED STATES MARKET:

A trial shipment of shrimp from Western Australia was consigned to the United States the latter part of 1962 by a firm at Carnarvon. The firm reported that it met with high success. Two directors of the firm made a survey of United States markets and processing methods in late 1962. They reported that there was a good market in the United States for Western Australian shrimp that were properly processed and graded. (*Fish Trades Review*, Australia, December 1962.)

Note: See *Commercial Fisheries Review*, December 1962 p. 61, October 1962 p. 46.

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SURVEY OF SHRIMP RESOURCES IN GULF OF CARPENTARIA PROPOSED:

Fishing interests at Queensland in 1962 began to explore the shrimp resources in the Gulf of Carpentaria. Intense exploitation by Queensland and New South Wales vessels of the shrimp grounds that stretch from the Newcastle area in New South Wales to the Rockhampton area in Queensland has created interest in new shrimp fishing areas.

A representative of a Queensland trawling company was reported by a Brisbane newspaper late in October 1962 as

saying that the company planned to move in a trawler fleet and a mothership, after the wet season, capable of handling 100 tons of shrimp a week. It was also considering air-freighting shrimp.



The Queensland officer, in charge of State fisheries, was reported by another periodical as having said:

"We think there is a lot that can be done with the Gulf, but it will be a big operation.

"The first thing is to find out whether the shrimp and fish resources are big enough to carry an industry. Then, if a proper survey establishes that the potential is really big, a major fishing port will emerge on the Gulf coast. It could be at Weipa, which has a deep water port able to take export ships, or at Karumba, with planes freighting out the shrimp and fish.

"From 100 to 200 vessels could work in the Gulf, with women ashore preparing the catch for the markets of the world.

"The Government is taking the first step by preparing a detailed submission to the Commonwealth stating the case for full survey of resources."

At least £250,000 (US\$561,000) would have to be spent on facilities before a stable fishing industry could be established in the Gulf of Carpentaria, another Brisbane newspaper reported.

The same newspaper reported that there were indications that the Gulf of Carpentaria "could be one of the best tuna grounds in Australia." A seafood processor from the Brisbane area reported after a trip to the Gulf that a six month survey of facilities would have to be made.

Experimental catches of shrimp made by the above seafood processor and his party, using the only trawler in the area, were encouraging. He stated it would be impossible to set up an industry at the Gulf immediately because of the primitive state of the area.

There are no fueling, wharf, or refrigeration facilities; roads are inadequate for the heavy trucks which would be needed; there is no general fresh water or electricity supply; and there is no labor pool, the seafood processor stated.

He added, at least half of the vessels working from Gold Coast ports would not be well enough equipped for the Gulf.

A meeting of the Queensland Licensed Boatowners, Skippers and Trawler's Association on October 26, 1962, reportedly decided to ask the State Government to survey the Gulf's shrimp potential, and ask all professional fishermen's organizations to join it in discussing the proposed survey with the Queensland Minister in charge of fisheries. (*Australian Fisheries Newsletter*, December 1962.)

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TASMANIAN SCALLOP LANDINGS IN 1962 SET NEW RECORD:

Scallop landings in Tasmania in 1962 reached a record 1,239,000 pounds (meat weight) as compared with 1,070,000 pounds in 1961 and the previous record in 1956, of 1,198,000 pounds. The Tasmanian Minister for Fisheries said that in 1962 there was a change in the localities where most of the scallops were taken. In the Channel area, production was 460,000 pounds compared with the one million pounds in 1961, but only part of the Channel was open for dredging during May 1962.

The poor Channel results forced fishermen to the east coast areas where some 780,000 pounds were landed, as compared with 22,000 pounds in 1961. Results from Ringarooma Bay were very disappointing.

The Minister said that research work by the Federal Fisheries Division and State fisheries officers was continuing in the Channel area. Late 1962 exploratory fishing indicated great numbers of small scallops in certain areas, and it might be necessary to close that area in 1963. A decision was due to be made after the program of test dredging was completed. (*Australian Fisheries Newsletter*, December 1962.)



Belgium

EFFECT OF EEC POLICIES ON IMPORTS OF FISHERY PRODUCTS:

Following is a report by the Canadian Embassy in Brussels on the possible effect of European Economic Community (EEC) policies on Belgian imports of fishery products:

Belgium's 9 million people consume about 270 million pounds of fishery products each year. Per capita fish consumption is about 30 pounds a year and over 70 percent of this is supplied by imports.

Table 1 - Belgian Trade in Fisheries Products, 1961

Item	Quantity	Value	
		Million C\$	Million US\$
Fish production	Metric Tons 46,300	11.0	10.2
Fish exports	13,500	5.6	5.2
Fish imports	89,500	37.5	34.8
Fish consumption . . .	122,300	42.9	39.8

The Belgian fishing industry employs less than 2,500 full-time fishermen and shore workers. The main species caught by Belgian vessels are sole, cod, plaice, haddock, and shrimp.



Sorting of fish on board of vessel.

The leading fishery imports by volume are herring, mussels, mackerel, canned salmon, canned sardines, and oysters. On a value basis, canned salmon is Belgium's most important fisheries import.

Changes now taking place in the Belgian market for fishery products as a result of membership in the EEC will affect foreign suppliers.

In the past, Belgium has had relatively low import duties on most unprocessed fishery products and the rates on processed fishery products have at least been lower than those imposed by several other EEC countries. The new common external tariff towards which the EEC countries will move during the next few years represents an average of national rates. The result will be a substantial increase in Belgian import duties on fishery products from countries outside the EEC (see table 2).

Table 2 - Belgian Import Duties on Fishery Products

Product	Rate in Effect in 1962	Proposed Rate for 1970 ^{1/}
	. . . . (% Ad valorem)	
Salmon:		
Frozen	4.9	10
Canned	6.0	16
Lobster:		
Live	18.0	25
Canned	6.0	20

^{1/}Common external tariff that EEC countries plan to establish by 1970.

The common external tariff planned for 1970 will inevitably help the position of suppliers within the EEC. It will bear most heavily on suppliers outside the EEC whose products incur high transportation costs. European countries not members of the EEC will improve their market possibilities to

Belgium (Contd.):

the EEC at the expense of such countries as Japan, Canada, and the United States.

Although consumption of fresh and frozen fish will probably increase in Belgium, producers within the EEC will have first chance to service any new demand. National fishing industries in the EEC are being modernized and coordinated to permit them to serve the growing European market on the best possible terms. (Foreign Trade, January 12, 1963.)

Note: See Commercial Fisheries Review, November 1962 p. 60.

**Brazil****FISHERIES TRENDS IN RECIFE AREA, JULY-DECEMBER 1962:**

The spiny lobster season (to the extent that a "season" exists in northeast Brazil) began in September 1962. By the first of October, 490,607 pounds of spiny lobster tails had been shipped to New York City through the port of Recife at the official price of US\$0.80 a pound, a welcome source of foreign exchange.

During late November and early December last year, customs officers in Recife temporarily impounded several Japanese fishing vessels for investigation, charging them with violations of their agreement with the Brazilian Government. Also, during mid-December last year, port authorities refused to sell fuel to two Japanese vessels, supposedly on the grounds that they had been illegally selling their catches outside Brazil, a violation of the agreement.

In late July last year, two more French fishing vessels fishing for spiny lobster off the Northeastern coast were arrested and brought into port. As in previous cases, they were well outside the three-mile limit, but on the continental shelf. Brazilian authorities again emphasized that for purposes of protection of fisheries and mineral deposits they do not recognize the three-mile limit. Instead they claim jurisdiction out as far as the edge of the continental shelf--in that area about 40 miles offshore. (United States Consul, Recife, January 24, 1963).

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FISHERIES TRENDS IN SOUTHERN BRAZIL, JANUARY 1963:

The government of Santa Catarina State in southern Brazil granted 16 million cruzeiros (US\$33,684) towards the construction of two fishery cold-storage plants in the municipalities of Biguacu and Garopaba. The money will be spent to purchase sites, build warehouses, install refrigeration systems and a water supply, and buy motors.

Fishery experts of the Food and Agriculture Organization (FAO) are going to survey fishing possibilities in coastal waters of Santa Catarina State. The results of their investigation will be submitted to FAO. (United States Consulate, Curitiba, February 19, 1963.)

Note: Brazilian cruzeiros 475 equalled US\$1.00 at the free exchange rate during January 1963.

**British Guiana****SHRIMP FISHERY TRENDS, 1962:**

Shrimp landings in British Guiana in 1962 probably exceeded 4 million pounds, according to a representative of 1 of 2 United States shrimp firms in the country. In 1962, the active shrimp fleet in British Guiana increased to 55-60 vessels. But there was a decline in the average catch per vessel. It is believed that 90 percent of the shrimp catch was exported to the United States.

Shrimp is British Guiana's only significant fishery export. There is a small-scale fishery for other species for the local market. In 1961, British Guiana imported about 2,257 short tons of fishery products, most of which came from Canada. (United States Consulate, Georgetown, February 17, 1963.)

**Canada****FISHERIES COUNCIL PROPOSES 12-MILE FISHING LIMIT:**

Spokesmen for the Fisheries Council of Canada (industry organization) met with a committee of the Federal cabinet in Ottawa on January 28, 1963, and urged the Government to take action on declaring national waters, establishing base lines, and adopting a 12-mile fishing limit.

The Council's spokesmen recommended that such major areas as the Gulf of St. Lawrence, the Strait of Belle Isle, Hecate Strait, and Queen Charlotte Sound be declared as Canadian national waters in the same way as Hudson Bay and the Bay of Fundy are now recognized.

Canada (Contd.):

The Council brief suggested that declaration of the new zones take into special consideration the historic rights of France and the United States in Canadian national waters. As a first step, negotiations should begin with those two nations to reach a mutual understanding about their rights in an enlarged Canadian zone.

The brief proposed unilateral adoption of a plan which Canada and the United States jointly sponsored at the Second United Nations Conference on the Law of the Sea (held in 1960). This plan called for a 6-mile territorial sea and an additional 6-mile exclusive fishing zone. It was supported by 54 nations but fell one vote short of approval.

"The rapid increase in world fishing effort and efficiency has focused attention on the fact that, unless adequate safeguards are taken, the marine resources that have played such a vital role in the development of the Canadian economy will be harvested by foreign fishing fleets," the brief said.

Calling for adoption of the 12-mile limit, the brief declared that "unilateral declaration of the Government's policy must be followed immediately by active enforcement . . . and the policing of foreign fishing fleets."

"In the Council's opinion, enforcement is absolutely essential if Canada is to maintain her position in world fisheries."

In keeping with terms of the 1960 proposal, any nation whose vessels had made a practice of fishing in the outer 6 miles of the proposed 12-mile zone for at least 5 years would have the right to continue fishing that area for another 10 years.

But, apart from those special circumstances, foreign fleets would be barred from the exclusive zone. This would permit for the first time an effective program of fisheries management and conservation to preserve the Canadian fishing industry.

Maps of Canada's east and west coasts were attached to the brief showing the Council's proposals for drawing boundary lines of the protected zone. The base line would cut across all major bays and straits, turning them into national waters. (Fisheries Council of Canada, *Bulletin*, February 1963.)

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LIVE LOBSTERS SHIPPED BY AIR TO EUROPE:

Lobstermen of Canada's Maritime Provinces are finding new markets for their catch in Europe. Live lobsters from New Brunswick are crossing the Atlantic by jet at the rate of about 100,000 pounds a month and are turning up in such places as London, Paris, and Rotterdam. A St. Andrews, N.B., firm is the pioneer in this field and expects to ship about 500,000 pounds to Europe before the end of March. Working with the New Brunswick firm is a Canadian airline whose salesmen were responsible for finding the markets.

"It was no problem to sell Maritime lobsters," a spokesman of the airline stated, "their quality is well known in Europe. The problem was to convince buyers that it was possible to get them there alive."

About 50,000 pounds crossed the Atlantic in 1962 in the first season the airlift was used, and the total is expected to be 10 times greater this year.

The secret of getting live lobsters to the European market is careful packaging and speedy delivery. The lobsters

are put in waterproof, cardboard cartons filled with wood chips or seaweed and dampened with sea water. They are kept at temperatures of 38°-45° F. during transit.

From St. Andrew's to their destination in Europe takes less than 24 hours. The lobsters are trucked to St. John, N. B., where they are placed aboard a shuttle airliner for the flight to Montreal, and transferred to a big jet for the Trans-Atlantic flight. The mortality rate is said to be as low as one-half of 1 percent.

The airline set up a weekly shipping program to Europe that was booked until March 31, 1963. After that it hoped to start shipments from Newfoundland. One Newfoundland fish exporter has expressed interest in the idea so far and other firms also may take part.

The airline official says that the outlook for the future is excellent. Europeans are enjoying unprecedented prosperity and appear well able to afford the tasty shellfish. He also stated that any Maritime lobster dealer interested in the European market need only contact the airline. The airline will send its own salesmen to Europe to find buyers, and then provide the aircraft to get the lobsters safely to their destination. (*Canadian Fisherman*, February 1963.) 3.)

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BRITISH COLUMBIA'S NEW LICENSING SYSTEM FOR COMMERCIAL FISHING:

British Columbia's commercial fishermen will have only one fishing license number a year under the new policy of the Canadian Department of Fisheries which became effective January 1, 1963. Previously, each license obtained by a fisherman had a different number. Licensing regulations remain the same, requiring fishermen to obtain a separate license for each type of fishing gear or fishery. But under the new system, each license will have the same number as the first one issued. The number must be displayed on every fishing boat.

When applying for each commercial fishing license, a fisherman will, as always, have to provide evidence of Canadian citizenship or of active service in Canada's Armed Services.

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NEW DEPUTY MINISTER OF FISHERIES APPOINTED:

The Canadian Prime Minister, on February 26, announced the appointment of Dr. A. W. H. Needler, O.B.E., Ph.D., F.R.S.C., of Nanaimo, B.C., as Deputy Minister of Fisheries to succeed the late G. R. Clark. One of the world's most respected fishery scientists, Dr. Needler for more than 35 years has studied the fishery resources of both the Atlantic and Pacific Oceans upon which the major part of Canada's fishing industry depends.

Canada (Contd.):

Director of the Fisheries Research Board of Canada's Biological Station at Nanaimo, B.C., since 1954, Dr. Needler was also Director of the Board's Biological Station at St. Andrews, N.B., from 1941 until his transfer to the west coast. For a period (1948-1950) he acted in the dual capacity of Assistant Deputy Minister of the Department and Director of the Board's St. Andrews Station.

In January of this year, Dr. Needler was appointed chairman of the recently-established Food and Agriculture Organization (FAO) Advisory Committee on Marine Resources Research, which held its first meeting at FAO's headquarters in Rome from January 28-February 2.

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NEW GOVERNMENT PATROL VESSEL FOR GREAT SLAVE LAKE:

Modern design techniques and building materials will be used in the construction of a new Canadian Department of Fisheries vessel for Great Slave Lake in the Northwest Territories. The 38-foot vessel will have a moulded fiber glass hull and be propelled by a single Diesel engine. It will have such navigational aids as an echo sounder, a directional finder, and a radio-telephone system. The vessel will be operated by a crew of two fisheries officers. Although primarily intended for patrol duties, it will also take part in search and rescue operations when called upon.

Canadian officials feel that the vessel's fiber glass hull is ideally suited for Great Slave Lake. Gill-net vessels of similar construction have been used with a great deal of success by British Columbia fishermen.

A contract for the construction of the vessel at a cost of C\$39,427 (US\$36,547) was awarded to a boat yard in Steveston, B.C., on February 18, 1963. When ready for operation late in the summer of 1963, the new vessel will replace the Mareca. Another vessel, the Marila, is also employed on Great Slave Lake. The lake supports an important commercial fishery for lake trout and whitefish, and in recent years has attracted many tourists and sports fishermen. Department of Fisheries vessels on Great Slave Lake are in service from

the ice break-up in the spring until freeze-up, which is usually from June to September. (Canadian Department of Fisheries, Ottawa, February 18, 1963.)



Ceylon

FOREIGN EXPERTS REPORT ON FISHERIES DEVELOPMENT:

As a result of an appeal made last year by the Government of Ceylon for more foreign aid for fisheries development, two experts sent under the West German aid program have completed a feasibility survey of the fisheries industry. In their press interview on their departure they were reported to have said that Ceylon could become self-sufficient in fish within a few years if their four recommendations were carried out. These entail the development of Galle Harbor as a long-line tuna fishing center, development of the trawler fishing potentials of the San Pedro and Wadge Banks from centers at Trincomalee and Colombo, exploitation of fresh-water and brackish water fisheries, and setting up small canning plants.

Editorials in Ceylon newspapers on the subject of reports by experts over a period of almost 20 years have been critical. These newspapers state that, Ceylon, although surrounded by water, still must import most of one of its basic items of diet (fish). (United States Embassy, Colombo, February 12, 1963.)



Chile

FISHERIES TRENDS, JANUARY 1963:

Representatives of the Corporación de Fomento de la Producción de Chile (CORFO) were scheduled to arrive in Arica (located near Peruvian border) in late January 1963 in order to negotiate with the Junta de Adelanto de Arica (JAA) a joint development plan for the next five years. Under the terms of the draft plan, CORFO would match JAA contributions of approximately 500,000 escudos (about US\$475,000 at official rate of exchange) for industrial development projects. CORFO would also supply technical assistance for such projects, which would probably involve mainly fish processing and fish meal plants.

Chile (Contd.):

On December 31, 1962, a Japanese fishing net company was authorized to bring into Chile the sum of US\$225,000 to establish a subsidiary firm for the manufacture of nets, floats, and other fishing gear. The firm will be located in Iquique, Tarapaca.

The pilot of a light plane operating out of Iquique in late December last year reported sighting approximately 20 fishing vessels within "Chilean territorial waters." He identified the vessels as flying the flag of "a North American country which was not Canada or Mexico."

The reported sighting drew an editorial blast from an Iquique newspaper which characterized the "invasion" as a violation of international treaties.

United Nations technicians were scheduled to visit Tarapaca Province late in January, in connection with a study now being prepared on the development of the fishing industry in Chile.

Figures released in January 1963 indicate a considerable increase in landings at the port of Tocopilla for 1962 as compared to 1961. The reported landings for 1962 were 300,286 kilos (662,000 pounds) as compared to 241,058 kilos (531,000 pounds) in 1961. The increase is reportedly due to the increased use of purse seines by Tocopilla fishermen. (United States Consul, Antofagasta, February 1, 1963.)



Colombia

FOREIGN VESSELS FISHING OFF COASTS CAUSE CONCERN:

The controversy over the incursions of foreign (mostly United States) tuna vessels in Colombian waters was the subject of considerable comment in newspapers early in February 1962. Editorials, eye-witness accounts, and editorializing news stories resulted in the Foreign Ministry issuing a statement to clarify misstatements and erroneous conclusions in the newspapers as regards Colombia's international obligations in the field of territorial waters.

An editorial in one of the large Bogota newspapers on February 6, stated that Colombian fishing interests were going to petition the government on the need to preserve the fishing resources of the country from foreign incursions. It stated that "It is inconceivable--as paradoxically happens--that the extensive Colombian waters might be constantly visited by fishing boats of all nationalities in search of the undue appropriation of our riches."

The next day the same newspaper published the first of a two-part "eye-witness" account of the activities of United States tuna vessels off the Pacific coast, written by a retired Colombian Navy captain. It described in particular the activities of a United States vessel which was fishing off Buenaventura and stated that about 40 foreign flag vessels had been fishing in those waters during January. It called for the application of national sovereignty through improved policing measures by the Colombian Navy.

Another news story on February 8 commenting on the Navy captain's comments, quoted a manager of an Atlantic coast fishing cooperative as calling for greater naval vigilance. This source also said that even this would not be sufficient as it was necessary to pass fishing legislation declaring Colombia's autonomy to the 12-mile limit as in the rest of Latin American countries. He declared further that the Geneva Convention had agreed on a 7-mile limit, but only Colombia of the Latin American countries had accepted this solution.

In a letter dated February 11 the Foreign Ministry Secretary-General rebutted this testimony. He said that in the First United Nations Conference on Rights of Sea at Geneva in 1958, four conventions were signed: (1) On the Territorial Sea and Contiguous Zone; (2) On the High Seas; (3) On Fishing and Conservation of the Live Resources of the Sea; and (4) On the Continental Shelf. He wrote that in none of these, nor in any other international agreement or national legislation, was there established a 7-mile limit. In Article 24 of the Convention on the Territorial Sea and Contiguous Zone, he said, there was a disposition which stated that the breadth of the territorial sea and adjacent area together could not exceed 20 kilometers or 12 miles. However, he pointed out that neither this convention nor the one relating to the high sea had ever been presented by the Government to the Congress and consequently the cited norm has never been accepted in Colombia.

The Foreign Ministry's Secretary-General went on to state that the Conventions on Fishing and Live Resources of the Sea and on the Continental Shelf were approved by the Congress in 1961 (Laws 9 and 119) but neither of them contained anything concerning jurisdictional limits. He said that in the Geneva Conference there was never any real agreement on the extent of the territorial sea. He promised that the Foreign Ministry would soon publish the report of the Colombian delegation at the Conference which reviewed the incompatible positions of the various states at the Conference which was the reason that a two-thirds majority on norms for the territorial sea was never attained and therefore never adopted. On the other hand, he added, Colombian legislation in effect (Law 14 of 1923 and Law 57 of 1931 in the Customs Code) relates directly to the exploitation of underwater hydrocarbon deposits and the vigilance of fishing within a jurisdiction of 12 miles or 20 kilometers. (United States Embassy, Bogota, February 15, 1963.)



Cuba

JAPAN DELIVERS FISHING VESSELS:

Three of five modern fishing vessels built in Japan for the Cuban Government arrived in Havana early in 1963, according to reports. The vessels were scheduled to begin fishing off the Brazilian coast with Japanese and Cuban crews. Delivery of the other two vessels was expected in Havana in March 1963.

Cuba (Contd.):

A Japanese source said that each vessel displaces about 400 tons and carries a crew of 16.

Note: See Commercial Fisheries Review, August 1962 p. 73.



Denmark

FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, 1962:

Denmark's exports of fresh and frozen fillets and blocks in the year 1962 were 19.7 percent greater than in 1961, mainly because of an increase of 97.1 percent in exports of herring fillets. Exports of flounder and sole fillets increased 8.6 percent, but exports of cod and related species declined 4.6 percent. During 1962 exports to the United States of fresh and frozen fillets and blocks of about 11.1 million pounds (mostly cod and related species) were up from the exports of about 10.5 million pounds in 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during December 1962 were 20.1 percent above exports in the same month in 1961. Of the total exports, about 285,000 pounds (mostly cod and related species) were shipped to the United States in December 1962 as against 354,000 pounds in the same month in 1961. The leading buyer of frozen fillets in December 1962 was West Germany with 48.2 percent of the total, followed by the United Kingdom with 15.3 percent.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, 1962 ^{1/}				
Product	December		Jan.-Dec.	
	1962	1961	1962	1961
Fillets and Blocks:	.....(1,000 Lbs.).....			
Cod and related species	1,362	1,491	28,658	30,027
Flounder and sole	1,679	1,493	28,255	26,008
Herring	3,213	2,246	27,511	13,959
Other	85	49	678	1,130
Total	6,339	5,279	85,102	71,124
Industrial Products:	..... (Short Tons)			
Fish meal, fish solubles, and similar products	4,123	1,940	69,623	49,733
^{1/} Shipments from the Faroe Islands and Greenland direct to foreign countries not included.				

Denmark's exports of fish meal, fish solubles, and similar products in 1962 were 40.0 percent greater than in 1961. Exports to the United States were 110 tons in 1962 as against 28 tons in 1961.

During December 1962, Denmark's exports of fish meal, fish solubles, and similar products were 112.5 percent above the amount shipped out in the same month of 1961. The principal buyers were West Germany and the United Kingdom.

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FISHERY LANDINGS AND EXPORTS INCREASE IN 1962:

In 1962, Denmark's record fishery landings of 775,000 metric tons with an ex-ves-

sel value of 460 million kroner (US\$66.6 million) were up 23 percent in quantity and 11 percent in value from the previous year in spite of a two percent decline in the number of Danish fishermen. The increase was due mainly to heavier landings of industrial fish as a result of the improved world fish meal market. A study of fishing profits in 23 Danish ports showed a 5.3 percent return in 1961 on investment in fishing vessels.

Denmark's total exports of fishery products in 1962 reached a record level of 320,000 tons valued at 585 million kroner (\$84.8 million), up 18 percent in quantity and 21 percent in value from the previous year.

In 1962, Danish exports of fishery products to the United States were 4 percent greater than in 1961. There was an increase in shipments to the United States of frozen lobsters (up 42 percent), as well as frozen cod fillets, canned herring, and canned brisling (all up about 10 percent). But shipments of frozen pond trout to the United States dropped 20 percent in 1962 mainly because of better markets in Europe.

In Greenland in 1962 the cod catch was 23,000 tons (up 2 percent from 1961); shrimp landings were 3,300 tons (up 32 percent); and the salmon catch was 250 tons (up 150 percent).

Faroese trawlers landed a record 35,000 tons of salted fish in 1962. Exports of iced, salted, dried, and frozen fish from the Faroe Islands in 1962 were valued at 113 million kroner (\$16.4 million), up 21 percent from 1961. (United States Embassy, Copenhagen, January 30, 1963.)

Note: 6.902 Danish kroner equal US\$1.00.

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FISHERIES FOR 1962 REVIEWED BY INDUSTRY LEADER:

Accomplishments of the Danish fishing industry in 1962 and prospects for the future were reviewed at the annual meeting of Denmark's Fisheries Council in mid-January this year. The Council is made up of the eleven major fisheries associations who have joined together to promote and protect the interests of the fishing industry.

The new chairman of the Council (Director of a cooperative which produces and exports a large volume of fishery products to the Continent and the United States), review-

Denmark (Contd.):

ed Denmark's 1962 record production (about 1,708 million pounds valued at about US\$84.8 million) of fish and found that conditions were not as favorable as the statistics suggested. There had been labor shortages both on shore and at sea. Stormy weather had caused heavy losses, and average prices for the more important species, such as plaice, had declined slightly and were not counterbalanced by the increased prices for salmon, eels, lobster, etc. Fortunately, fish meal prices recovered and stimulated fishing for industrial species which lessened competition in the food fish fishery. However, he warned that a balance must be maintained between those fisheries if the Danish fishing industry is to continue to expand.

He was surprised that the fishermen's organizations could not reach agreement on a minimum price regulation for plaice which seems so advantageous to them. He believed it would be welcomed in the export industry if held to the original proposal of about 7 U. S. cents a pound. He believed further, that many of the difficulties hindering effective cooperation in the industry arose from the number of associations involved. The current 12 associations could be curtailed to 2--one to represent fishermen, and one to represent processors and marketing interests.

His criticism of the Government-sponsored Fisheries Commission (established in June 1961 to chart a future course for the Danish fishing industry) was directed mainly at the delayed results of its work. He believed its conclusions might not be wholly satisfactory because the more than 30 industry members could not spend the time required by the numerous committee meetings. Concentration on only a few of the questions might have been more profitable.

The Council's chairman suggested the Commission consider the establishment of a research institute devoted to the study of techniques of preparing, processing, packaging, transporting, and marketing Danish fishery products, possibly through expanding the present technological research laboratory in Copenhagen.

Speaking immediately prior to the breakdown of the European Economic Community and United Kingdom negotiations, he mentioned the general agreement within the fish-

ing industry that Denmark should join the Common Market as soon as possible after the United Kingdom was accepted. Some concern was expressed, however, over maintaining necessary markets in the East Bloc countries especially East Germany, for herring and cod fillets valued at about US\$3 million annually in the latter country alone. Demands of the Common Market would require mergers into larger exporting units and a significant increase in the size of the producing segment of the Danish industry.

Effective market promotion by a joint effort of the Government and the industry was viewed as of the greatest importance in the selling of Danish fishery products, although a satisfactory method for industry contributions had not been found. Although the fishing industry had representation on numerous bodies, he regretted that, despite its standing as the third largest exporting industry, it had not yet been possible to place a representative on the Economic Council.

The Danish Fisheries Minister explained to the meeting the proposed changes in the law governing the Fisheries Bank. These include an increase in capital, loans to the Greenland fishing industry, and an expanded advisory group. He regretted the loss of 43 fishermen, mostly in vessel sinkings in 1962, and hoped that the discussions under way with respect to a Nordic rescue service in the North Sea would minimize future losses. He favored the establishment of a fisheries institute for research in production, marketing, packaging, etc. Criticism of the lack of recommendations from the Fisheries Commission was not justified. Some of the work of the eight subcommittees was hampered because of the uncertainty surrounding the establishment of a joint European fisheries policy. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, February 6, 1963.)

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FISHERY PRODUCTS MARKETING IN SOME EUROPEAN COUNTRIES REVIEWED:

The Danish Fisheries Attache with headquarters in Bern, Switzerland, and responsibilities for that country as well as France, Belgium, Luxembourg, Italy, Czechoslovakia, and Austria reported that Denmark's exports of fishery products to those countries had increased in value from US\$11 million to over \$17 million in the last four years. He stressed the need for market promotion, for quality,

Denmark (Contd.):

and for product identification with Denmark in order to take the fullest advantage of Denmark's reputation as a quality producer. He reported some confusion by housewives over the illustrations on packaged raw-breaded fishery products. And he suggested again that the industry look into the culture of muskels for export to France rather than sending them to Holland where they are cultured and reexported to France.

He reported that the important question in France is whether it will attempt to produce frozen fillets and itself stimulate their sales in competition with countries already established as frozen fillet producers. Alternatively, France might well concentrate on fresh fillets and leave the frozen fillet market to present producers and to an increased production in its North American island possession, St. Pierre.

His report stated that Danish exports to Italy increased 35 percent in four years. But there are credit problems which indicate the need for a credit information system.

In Belgium, he reports, there are numerous self-service stores and supermarkets but considerable market promotion will be required to reach the large potential market because frozen fish is not yet widely used.

In Austria, according to Denmark's Fisheries Attache, the demand for first-class fish is limited but may increase with greater purchasing power. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, February 6, 1963.)

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AUCTION OF GREENLAND SEAL SKINS:

The Danish Royal Greenland Trade Department held an auction of Greenland seal skins in Copenhagen on March 6, 1963. At the auction, 13,147 Greenland ringed seal skins, 132 bladdernosed seal skins, 1,386 harp seal skins, and 24 saddle seal skins, were offered for sale. (United States Embassy, Copenhagen, February 20, 1963.)

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NEW FROZEN FISH PRODUCT
TO BE MARKETING:

A new fishery product--skinless and boneless plaice--has been developed by a large

Danish filleting and freezing firm in Fredericia, Denmark. The breaded and frozen product has the same appearance as fresh headless plaice. It may be cooked without thawing and served in the same manner as plaice with skin and bones. It was expected to appear on the Danish market in February 1963. Substantial orders for the new product have been received from the United Kingdom and the Continent.

A production of 60,000 boneless and skinless plaice per day is planned on a new processing line when the cold weather moderates and supplies of raw material become adequate. A patent has been applied for on the process. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 23, 1963.)

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SOVIET INTERFERENCE WITH
FISHING OPERATIONS REPORTED:

In the last year or two the Danish Fisheries Ministry has had 4 or 5 cases of Soviet interference with Danish fishing operations reported to it. All occurred in the Danish salmon fishery in the Eastern Baltic Sea. Since it is difficult to prove responsibility for interference or damage, the evidence was deemed adequate, in only two cases, to present to the Danish Foreign Office for referral to the Soviets. In each of those instances, the Danish fishermen had secured the registered number of the vessels they believed were responsible. In the first case, the Soviets replied that it had no fishing vessel with such a number, which apparently has settled the issue. There has not yet been a report on the second case.

The Fisheries Ministry has stressed the very great difficulty in proving when and how gear was lost and by whom the loss was caused. In the Baltic Sea, for example, it is difficult to distinguish between Soviet, Polish, and East German trawlers.

Danish salmon cutters occasionally are apprehended for fishing in Soviet territorial waters.

Local newspapers reported, in the latter half of 1962, complaints by fishing vessels from Skagen, fishing port at the northern tip of Denmark, that Soviet trawlers discarded worn out pieces of fishing gear in the Kattegat. In several instances, the gear fouled the screws of Danish fishing craft. These com-

Denmark (Contd.):

plaints were not brought to the attention of the Fisheries Ministry for action.

On January 26, 1963, an Esbjerg cutter captain reported to the Esbjerg daily paper that on January 8, while fishing in the Eastern Baltic Sea off the Estonian coast, his cutter lost half its gear--a long-line carrying 900 hooks and 12 lighted buoys used to mark the location of the long line. At the same time a Danish cutter from Bornholm, a Danish island just south of Sweden, lost a long line carrying 600 hooks and 10 lighted buoys. The two cutters had set their gear over a stretch of 25 miles about 16 nautical miles off the coast. When the gear was hauled, the loss of hooks, line and buoys was noted and, later, Soviet trawlers were observed near the remainder of the long line. On board the trawlers, which fish for cod and brisling, buoys similar to those lost were observed. One trawler tossed two of the buoys overboard from which the batteries, lamps, and wiring had been removed. Photographs of the trawlers and their registered numbers were obtained.

The Esbjerg cutter captain planned to report his loss to the Fisheries Ministry in the hope that he may secure permission to enter Soviet ports to seek the lost gear. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 8, 1963.)



Faroe Islands

TUNA FISHERY IN CARIBBEAN AND OFF WEST AFRICA PLANNED:

Faroeese fishing interests are planning to use the vessels with which they now catch herring shark (*Lamna cornubica*) to fish for tuna during the off-season for shark. Beginning in January, February, and March 1964, after completing the herring shark season in the Northwest Atlantic off the North American coast, five freezer vessels (4 Faroeese and Norwegian and 1 Danish) will travel south along the United States coast to fish for tuna in the Caribbean. Later they will cross the South Atlantic to seek tuna off West Africa. The freezerships will be equipped with long lines and also with purse seines and power blocks. They hope to fish for tuna 3-6 months in order to keep the vessels operating profitably the entire year.

One 300-ton Faroeese freezer vessel is now being built to take part in the combined fishery.

In 1961 Faroeese freezerships fished intensively off Newfoundland, catching herring shark valued at US\$362,500 as compared with only \$43,500 in 1960. Most of the frozen shark was exported to Italy.

An official of the firm planning the new venture states that the freezer vessels are well equipped for handling tuna but he was uncertain where the catches might be delivered. While the Faroeese have not caught tuna heretofore they have had experience with long lines and are very good fishermen. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 6, 1963.)



Finland

IMPORT LICENSE REQUIREMENTS REMOVED FOR SOME FISHERY PRODUCTS:

Finland has lifted import license requirements from 343 tariff items, according to a report early in 1963 from the United States Embassy in Helsinki. The freed items include certain fish, certain preserved and canned fish, and specified animal oils. Most products entering Finland from the United States are now free of import licensing requirements.

In a related move, the Finnish Government increased remaining import quotas so that in 1963 importers of goods still subject to global quotas may spend up to 20 percent more for their purchases abroad. Most United States products still subject to controls may enter Finland under global quotas. (International Commerce, U. S. Department of Commerce, January 28, 1963.)



German Federal Republic

IMPORTS OF MARINE OILS, 1960-62:

During 1962, West Germany imported 64,816 metric tons of fish oil (exclusive of fish liver oils) or about 2.3 percent more than the 63,379 tons imported in 1961. In 1960, imports amounted to 65,098 tons. Imports of whale and sperm oil (59,044 tons) in

German Federal Republic (Contd.):

1962 declined 11.7 percent from the 66,905 tons imported in 1961, and were down 25.8 percent from the 79,610 tons imported in 1960.

The over-all imports of oil bearing materials (soybeans, cottonseed, copra etc.) increased sharply in 1962 as compared with fats and oils as such. Imports of 568,131 tons of fats and oils in 1962 were down 11.5 percent from the 641,690 tons imported in 1960. Over the same period imports of oil-bearing materials rose from 1,520,486 tons in 1960 to 1,646,275 tons in 1962, an increase of 8.3 percent. (Foreign Agriculture, March 4, 1963.)

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NEW STERN-TRAWLER:

The new stern-trawler factoryship Fritz Homan, which began fishing in late 1962, is one of the most modern vessels in West Germany's fishing fleet. It was built in a Bremerhaven shipyard by prefabricated methods of construction. The principal dimensions of the 1,319-ton all-welded vessel are: length over-all 76.5 meters (250.9 feet); length between perpendiculars 67.8 meters (222.4 feet); breadth 11.0 meters (36.1 feet); draft 7.3 meters (23.9 feet). The main engine is an 8-cylinder 2,100 horsepower Diesel which gave a speed of 16.2 knots during trials. Fuel oil bunkers have a capacity of 290 metric tons and fresh-water tanks hold a total of 106 tons.

The Fritz Homan can freeze 12 tons of fish a day in its two vertical plate freezers. Frozen fish blocks are held at -30°C . (-22°F). The vessel has 598 cubic meters (about 782 cubic yards) of fish-holding space, of which all or part can be used for frozen storage. It also has storage space for 70 tons of fish meal and 21 tons of liver oil and fish oil. The vessel's fish reduction plant has a daily capacity of 20 tons of raw material.

The latest fish filleting and heading machines were installed on the Fritz Homan. An interesting feature of the machines is that they can be converted to herring processing. European fishery firms are trying to increase the quantity and improve the quality of herring landings. Several of the

large German stern-trawlers have been fishing for herring recently with apparent success.

The deck layout is similar to that of other stern-trawlers built by the Bremerhaven firm. The trawl winch has a capacity on each drum of 1,200 fathoms. A full range of radio, navigational, and fish finding equipment was installed. The vessel carries two radar sets.

Accommodations are provided for a crew of 50. Ship's officers and engineers have single-berth cabins amidships, while the rest of the crew are quartered in forward cabins. (The Fishing News, December 28, 1962.)

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NEW TYPE FISHING VESSEL DESIGNED FOR "LUGGER" FISHERY:

A new type fishing vessel was designed by a Bremerhaven fishing company in conjunction with a local shipyard for the purpose of increasing the efficiency of the "lugger" or medium-size vessel fishery. The fishing company is thinking of building 6 of these vessels.

The vessel is designed for stern trawling, pelagic pair trawling, purse seining, and for fishing with gill nets. The cost of the new vessel is estimated at about DM 2.6 million (US\$650,000), including fishing gear, but without a purse seine net.

The vessel will be 450 gross tons and about half the size of the stern factory-trawlers built during recent years by trawler companies for fishing on distant fishing grounds, and will accommodate a crew of 22. It will be powered by a 1,200 hp. Diesel engine to give the vessel a speed of about 12 knots. The operating range will be about 8,000 nautical miles. The vessel will be equipped with a variable pitch propeller to increase its maneuverability. It will carry vertical and horizontal electronic fish-finders as well as a fish spotter which can be attached to the head rope of the trawl to permit adjustments of the depth of the net during mid-water trawling. The working space on the starboard side of the vessel will later permit the installation of fish-processing machinery, if so desired.

The construction of the new vessels is part of a program aimed at increasing the

German Federal Republic (Contd.):

efficiency of the German "lugger" fishery. As a rule German "luggers" catch herring in the North Sea with gill nets from about June through December. For the remainder



Lugger-type trawler, engaged principally in fishing for North Sea herring, docked at Hamburg.

of the year the "luggers" are laid up in their home ports. In recent years, the German "lugger" fishery has endeavored to improve its profits by equipping "luggers" for trawling during the off season for herring. It has become evident, however, that the fishery requires a new type vessel, about twice as large as a conventional "lugger" which can fish faster, employ new fishing techniques, and operate in medium-distant fishing grounds (around Iceland) which cannot be reached by conventional "luggers." (United States Consulate, Bremen, February 1, 1963.)



Greece

OUTBOARD MOTORS HELP
GREEK FISHERMEN:

Ten outboard motors manufactured in the United States were delivered by CARE to small fishing cooperatives in the villages of Psarades and Sayades in northern Greece.

The motors are being used to mechanize primitive but sturdy craft which were formerly hand-rowed. Mechanization has eased the hard life of the Greek fishermen who, when they worked their boats with oars, toiled almost 18 hours daily and spent weeks away from home. Using the motors, the fishermen can reach fishing grounds in one-fifth the time it would take to row.

The fishermen were trained in motor handling as well as simple maintenance and repair of the motors. More advanced maintenance instruction will be given one representative from each cooperative that received a motor. (Fishing News, December 28, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 70.

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SPONGE LANDINGS, 1962:

Greek sponge landings in 1962 totaled 68.4 metric tons valued at 30.4 million drachmas (US\$1.0 million), as compared with landings in 1961 of 56.5 tons valued at 27.6 million drachmas (\$0.9 million). A total of 56 sponge fishing vessels operated in 1962, while 62 vessels worked the sponge beds in the previous year. The widespread use of echo sounders helped fewer vessels land a larger catch in 1962. In addition, new sponge bearing fields were discovered in international waters, while beds in Greek waters continued to yield a good sponge crop. (Alieia, January 1963.)

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FISHERY LANDINGS, 1962:

Greek fishery landings in 1962 were down 4.3 percent in quantity but up 5.0 percent in value from those in the previous year. An increase in the catch in the Atlantic and Mediterranean areas was offset by a decline in the catch from other fishing areas. But the average value of the Atlantic and Mediterra-

Table 1 - Value of Greek Fishery Landings, 1961-1962

Fishing Area	Average Value of Greek Fishery Landings by Fishing Areas			
	1962		1961	
	Drachmas/Kilogram	U.S. Cents/Pound	Drachmas/Kilogram	U.S. Cents/Pound
Atlantic	10.0	15.1	10.2	15.4
Mediterranean	7.5	11.3	9.2	13.9
Middle and near water (trawlers and purse-seiners)	1/ 9.0	13.6	7.3	11.0
Inshore	14.0	21.2	12.5	18.9
Lagoons and lakes	16.0	24.2	15.0	22.7
Value of Total Greek Fishery Landings				
Total landings	Million Drachmas 869.0	Million US\$ 29.0	Million Drachmas 828.0	Million US\$ 27.6
1/Estimated				

Note: 30 Greek drachmas equal US\$1.00.

Greece (Contd.):

Table 2 - Greek Fishery Landings by Fishing Areas, 1961-1962		
Fishing Area	1962	1961
	(Metric Tons)	
Atlantic	17,000	14,500
Mediterranean	10,000	8,500
Middle and near water (trawlers and purse seiners)	48,000	53,000
Inshore	8,000	10,000
Lagoons and lakes	5,000	6,000
Total landings	88,000	92,000

nean catch declined, while there was a substantial increase in the average value of the catch from other areas. (Alieia, a Greek fishery periodical, January 1963.)

Note: See Commercial Fisheries Review, August 1963 p. 62.



Iceland

EXPORTS OF FISHERY PRODUCTS,
JANUARY-OCTOBER 1962:

During January-October 1962, there was a considerable increase in exports of frozen herring, frozen fish fillets, salted herring, herring oil, herring meal, and frozen whale meat as compared with the same period in 1961, according to the Statistical Bureau of

Icelandic Fishery Exports, January-October 1962 with Comparisons						
Product	Jan.-Oct. 1962			Jan.-Oct. 1961		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	2,353	47,045	1,081	3,970	75,991	1,869
Salted fish, uncured	25,190	304,649	7,068	27,532	279,011	6,839
Wings, salted	997	11,446	266	1,290	11,937	294
Stockfish	8,293	215,573	5,001	8,769	208,861	5,163
Herring on ice	4,899	17,144	398	3,756	9,641	237
Other fish on ice	31,825	114,863	2,665	24,982	122,880	3,023
Herring, frozen	17,187	94,117	2,184	10,628	49,227	1,211
Other frozen fish, whole	2,303	28,958	672	1,869	21,404	527
Frozen fish fillets	43,423	760,420	17,642	34,057	531,075	13,064
Shrimp and lobster, frozen	355	36,315	843	399	31,372	772
Roos, frozen	693	13,204	306	540	7,355	181
Canned fish	280	14,841	344	191	12,185	300
Cod-liver oil	4,437	34,072	780	4,824	39,609	974
Lumpfish roes, salted	421	6,411	149	486	8,237	203
Other roes for food, salted	2,746	37,936	880	2,475	24,960	614
Roos for bait, salted	1,387	8,678	201	1,348	6,131	200
Herring, salted	36,376	335,887	7,793	22,538	205,677	5,060
Herring oil	40,056	177,180	4,111	13,770	77,981	1,918
Ocean perch oil	15	59	1	460	2,572	63
Whale oil	1,687	13,660	317	917	5,452	159
Fish meal	19,516	122,314	2,939	26,620	107,666	2,649
Herring meal	39,251	256,554	5,952	24,479	124,323	3,058
Ocean perch meal	252	1,440	33	3,581	16,170	398
Wastes of fish, frozen	6,442	16,867	391	11,004	19,915	490
Liver meal	305	2,029	47	315	1,822	45
Lobster and shrimp meal	198	786	18	318	755	19
Whale meal	502	2,713	63	1,342	4,955	122
Whale meat, frozen	2,408	18,167	421	1,547	11,127	274

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents in 1962 and 2.46 U. S. cents in 1961.

Iceland's Statistical Bulletin, November 1962. Exports of fish meal, ocean perch meal, frozen fish waste, lobster and shrimp meal, whale meal, and dried salted fish decreased in the first ten months of 1962.

Note: Iceland's exports of fishery products, as shown in Commercial Fisheries Review, Jan. 1963 p. 92, cover January-September 1962 instead of January-October 1962.

FISHERIES TRENDS,

EARLY FEBRUARY 1963:

New Center for Fish Processing: An area in the Reykjavik inner harbor will be the site for a new fish-processing center. Several fishing companies have been granted building lots in the area and seven more are reported to be on a waiting list. The construction of two new plants at the center has already begun. The only previous processing plant at the location was a herring reduction plant which has been virtually inoperative since its erection 13 years ago. The new location will be favorable for various types of fish processing, since fish can be hauled from unloading vessels to the plants in three minutes.

New Method of Smoking Salmon: According to Icelandic newspapers, a French specialist visited Iceland in early 1963 to teach a method of smoking salmon more lightly to personnel of an experimental plant of the Federation of Cooperatives. The lighter type of curing, which is popular in Europe and England, requires first quality fish. The product will be marketed in Iceland under a trade name. It will be boneless without fins, but with the skin on, and vacuum packed. In the near future the experimental plant will start marketing other smoked products such as haddock, kippers, trout, and lumpfish. (United States Embassy, Reykjavik, February 8, 1963.)

Note: See Commercial Fisheries Review, March 1963 p. 67.

FROZEN FISH PRODUCTION, 1962:

In 1962, a record quantity of about 82,000 metric tons of fish was frozen in Iceland, up 5.6 percent from the 77,619 tons produced in 1961. The increase was due to greater freezings of herring from the excellent catch off the southwest coast. Frozen herring production amounted to 25,500 tons in 1962, as compared with only 3,733 tons in 1960. Groundfish freezings in 1962 totaled 45,500 tons. Iceland had about 90 freezing plants operating in 1962 with improved equipment which increased their capacity.

Most of Iceland's frozen fish production is exported through the Icelandic Freezing Plants Corporation. Icelandic frozen fish is also exported by a new firm which began operating in 1962, and the Fisheries Department of the Federation of Cooperatives. (United States Embassy, Reykjavik, February 15, 1963.)

Iceland (Contd.):

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-SEPTEMBER 1962:

Species	January-September	
	1962	1961
	.. (Metric Tons) ..	
Cod	165,719	175,589
Haddock	28,964	27,086
Saithe	8,710	8,374
Ling	4,758	4,034
Wolfish (catfish)	11,554	11,338
Cusk	3,781	3,677
Ocean perch	15,134	23,464
Halibut	1,119	1,214
Herring	412,715	250,805
Shrimp	349	990
Lobster	2,315	1,488
Other	7,397	7,712
Total	662,515	515,771

Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-SEPTEMBER 1962:

How Utilized	January-September	
	1962	1961
	... (Metric Tons) ...	
Herring ^{1/} for:		
Oil and meal	330,953	180,767
Freezing	18,194	10,730
Salting	55,515	55,075
Fresh on ice	7,718	4,119
Canning	336	114
Groundfish ^{2/} for:		
Fresh on ice landed abroad ..	16,540	19,994
Freezing and filleting	118,803	125,506
Salting	68,115	64,532
Stockfish (dried unsalted) ..	32,793	43,028
Home consumption	8,121	6,201
Oil and meal	2,764	3,227
Shellfish for:		
Freezing: Lobster	2,314	1,488
Shrimp	263	747
Canning (shrimp)	86	243
Total production	662,515	515,771

^{1/}Whole fish.
^{2/}Drawn fish.

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HERRING LANDINGS DECLINE AFTER MID-JANUARY:

Iceland's unfavorable weather conditions during the third week of January reduced herring landings, but total landings were far ahead of last year's record. As of January 19, total landings amounted to 110,772 metric tons as compared with 88,089 tons on the same date in 1962. Many vessels in mid-January were shifting to line fishing for groundfish. (U. S. Embassy, Reykjavik, January 25, 1963.)

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NEW PROTOCOL TO SOVIET TRADE AGREEMENT AFFECTS FISHERY EXPORTS:

The commodities covered by the new 1963-1965 Protocol to the Icelandic-Soviet Trade Agreement of August 1, 1953, were announced in January 1963. For the first time, Icelandic canned fishery products were included. But Icelandic shipments of frozen fillets to the U.S.S.R. will be reduced substantially by the new Protocol.

Under the new 3-year Protocol, Iceland will deliver annually to the U.S.S.R., 15,000 to 20,000 metric tons of frozen fillets, 12,000 tons of frozen herring, 14,000 to 15,000 tons of salted herring and Kr. 7 million (US\$162,564) of canned fishery products.

The Protocol for 1960-1962 called for Iceland to deliver annually to the U.S.S.R. 30,000 to 32,000 tons of frozen fillets, an unspecified quantity of frozen herring, and 12,000 tons of salted herring. (United States Embassy, Reykjavik, January 25, 1963.)

Notes: Iceland kronur 43.06 equals US\$1.

See *Commercial Fisheries Review*, July 1960, p. 50.



Ireland

SOVIET VESSEL CONVICTED OF VIOLATION OF TERRITORIAL WATERS:

On January 14, 1963, the Soviet fishing vessel *Paltus* was convicted in an Irish District Court of a violation of Ireland's territorial waters. The Soviet trawler was prosecuted under Sections 221 (unlawful entry) and 222 (violation after lawful entry) of the Fisheries (Consolidation) Act of 1959 and convicted only under Section 221 of the Act.

The conviction appears to have had no deterrent effect on Soviet intentions to expand fishing in the Irish Sea, for on January 22, a Soviet newspaper is reported to have announced plans to send more fishing vessels to "this promising area of the Atlantic." That official Soviet news agency remarked that the Irish Sea was the 10th fishing area in the Atlantic to be opened up by Latvian ships in the past two years.

The Soviets are not the only nationals showing an interest in the waters off the southeast coast where the herring have been running well. Polish, Dutch, Belgian, and

Ireland (Contd.):

French trawlers have been operating outside territorial waters since Christmas. On January 22, a French trawler was arrested on a charge of infringing Ireland's territorial limit.

Irish fishermen claim that foreign trawlers are catching a large proportion of the fish that would otherwise come further in-shore into their own nets. Evidence that this may lead to renewed pressure on the Government to extend the fishing limit to 12 miles was provided by a question to this effect raised in the Dail (Lower House) on January 24, 1963. The Minister for External Affairs replied by regretting that no international agreement had been achieved since the failure of the Law of the Sea Conference in 1960, by assuring the inquiring deputy that "the Government have constantly in mind the question of extending fishing limits by international agreement rather than by unilateral action," and by adding "we are still in touch with a number of Governments with a view to securing a regional agreement as the prospect of securing a world wide agreement seems at present rather remote." (United States Embassy, Dublin, February 1, 1963.)



Israel

NEW DIESEL-ELECTRIC STERN-TRAWLER LAUNCHED:

The 1,500-ton stern-trawler Hiram I, built in Le Havre, France, at a cost of US\$1.5 million for Israeli and Swiss interests, was launched in November 1962. The vessel includes such modern features as Diesel-electric propulsion, blast freezing tunnels, radar equipment, and air conditioned cabins for the 45-man crew. The new vessel is powered by three French-built Diesel engines which generate electric power used to turn the propellers and operate the fishing gear. The Diesel-electric system makes it possible to moderate speeds smoothly, picking up either slowly or quickly to top speed of 15 knots. The engines can be controlled from three positions: the navigation bridge, located about two-thirds of the way forward; the fishing bridge, mounted amidships on the after part of the superstructure with an unobstructed view of fishing operations; and the engine room. The

ship is provided with the usual navigational and fish-finding equipment in addition to radar. The trawl can be operated at depths up to 200 fathoms. Semi-automatic steering is controlled by a British-made gyroscope.

During fishing operations, the trawl is hauled up a stern chute onto the main deck. The fish are dropped through a hydraulically-controlled hatch to the deck below, where they are sorted, cleaned, and prepared for freezing. Two blast freezing tunnels, with a daily capacity of 20 metric tons of fish, freeze the fish at -40° C. (-40° F.). The frozen fish are packed in plastic bags and moved to the fish hold one deck down, where they are stored at -20° C. (-4° F.). Total capacity of the fish hold is 350 tons.

Following a shakedown cruise to the Grand Banks off Newfoundland in February or March 1963, the Hiram I was to begin fishing off the northwest coast of Africa. The vessel's fish catch is expected to be consumed almost entirely in Israel. The Hiram I will be operated by a new fishing company created by the Israeli labor federation, Histadrut, which owns the vessel jointly with Swiss shipping interests. The vessel is reported to be the first of a series of Diesel-electric trawlers, some of which may be built in Israel. (United States Consulate, Le Havre, February 4, 1963.)



Italy

TWENTY-THIRD INTERNATIONAL FISHING FAIR:

The XXIII International Fishing Fair and the VIII Nautical Exposition are scheduled to be held June 22-August 7, 1963, in Ancona, Italy. Included in the exhibits will be fishing equipment and items connected with nautical sports.



Japan

EXPORTS OF FROZEN TUNA, CALENDAR YEARS 1961 and 1962:

Frozen tuna exports to the United States in 1962 increased 24 percent in quantity and 45 percent in value, as compared with 1961. Marked increases occurred also in frozen tuna exports to Europe--up 17 percent in

Japan (Contd.):

Japanese Exports of Frozen Tuna, Calendar Years 1961 and 1962				
Country of Destination	1962		1961	
	Quantity	Value	Quantity	Value
	Tons	US\$ 1,000	Tons	US\$ 1,000
United States and Canada:				
Direct shipments	71,600	26,666	57,386	19,117
Transshipments	38,598	12,370	31,454	7,849
Total (Short Tons f.o.b.)	110,198	39,036	88,840	26,966
Italy	33,417	10,817	26,276	7,308
Yugoslavia	7,731	2,874	9,454	2,901
France	3,415	1,394	-	-
Ghana	834	170	92	17
Tunisia	480	165	606	180
Australia	160	21	-	-
Czechoslovakia	433	162	1,776	463
Spain	50	18	690	158
Cuba	330	83	300	87
Libya	575	190	395	110
Others	-	-	290	77
Total (Metric Tons c.i.f.)	47,425	15,894	39,879	11,301

Source: Suisan Tsushin, February 12, 1963.)

quantity and 40 percent in value. (Suisan Tsushin, February 12, 1963.)

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EXPORT QUOTAS FOR FROZEN TUNA,
FISCAL YEAR 1963:

The Tuna Committee of the Japan Frozen Foods Exporters Association met on February 5, 1963, for the third time, and considered quotas of frozen tuna for export to the United States (includes Canada) and Europe (mostly Europe, but includes shipments to North Africa and a few other areas) in the 1963 fiscal year (April 1963-March 1964).

The April 1963-March 1964 frozen tuna export quotas are: (1) to the United States and Canada, 110,000 short tons (unchanged from 1962 fiscal year); (2) to the European area, 70,000 metric tons; and (3) frozen tuna loins, 6,000 short tons (mostly to the United States).

The shipments of frozen tuna (exclusive of tuna loins) under the quotas for the Japanese 1963 fiscal year will be made in three periods--April-September, October-January, and February-March. Members of the Association will be required to turn over to the Association 30 percent of their allotments. This amount becomes a "free quota." Any frozen tuna export quota unused at the end of a period shall become part of the free quota for the following period. The free quota can be used in any of the three periods

within the fiscal year by exporters who have exhausted their allotment without limitation as to quantity.

The method of allocating the exports of tuna loins was not decided at the Association's February 5 meeting. (Japanese newspaper, February 7, 1963.)

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NEW BASES FOR ATLANTIC OCEAN
TUNA FISHERY UNDER CONSIDERATION:

With the increasing number of Japanese tuna vessels operating in the Atlantic Ocean, the tuna fishing bases in West Africa are crowded. Japanese tuna vessels operating in the Atlantic number about 120 per year, including 73 vessels belonging to the Prefectural Skipjack Tuna Fishermen's Association and 19 vessels from other fisheries cooperatives. The fishing bases in Africa including Las Palmas, Dakar, Freetown, Abidjan, Accra, Tema, and Lagos are playing an important role as transshipping points for direct exports of tuna to Europe and the United States.

The increasing number of vessels using those bases are making local facilities inadequate and tuna vessels are looking for new overseas bases. According to information received by a large Japanese fishing company recently, Sao Vicente Island of the Cape Verde Islands (Portugal) is beginning to attract the attention of tuna vessel owners.

The following is the report received from the Azuma Maru No. 16 (439 tons):

The Cape Verde Islands comprise nine islands of a volcanic group around 16°52' N. lat., 25° W. long. in the Atlantic off the southwest coast of Africa, one of which is Sao Vicente Island and its deep harbor of Port Grande. The first Japanese tuna vessel to stop at this port was the Shinyo Maru, followed by the Azuma Maru No. 16, Azuma Maru No. 23, and the carrier Banshu Maru No. 2.

Port Grande is surrounded by mountains in three directions, opening in the west. Quays are used for customs purposes, taking on oil, and for fish landings. Two more docks are under construction, 400 meters (437.4 yards) and 150 meters (164.0 yards) in length, plus 3 cranes will be ready in a few months. Longshoremen are not experienced, but are capable of landing 6.4 tons of frozen tuna in an hour.

Japan (Contd.):

A local fishery company owns 2 of the 45-ton, 3 of the 35-ton, and 4 of the 125-ton vessel classes plus 1 of the 150-ton class equipped with radio telephone and capable of fishing for skipjack tuna with hook and line, long lines, and purse seine. A cold storage plant has a capacity of 6,000 tons and can maintain a temperature of -20° to 25° C. (-4° to 13° F.) Ice-making capacity is 3 tons a day which is expected to be increased to an 80 ton capacity in a year or two. A packing plant will be completed in two months.

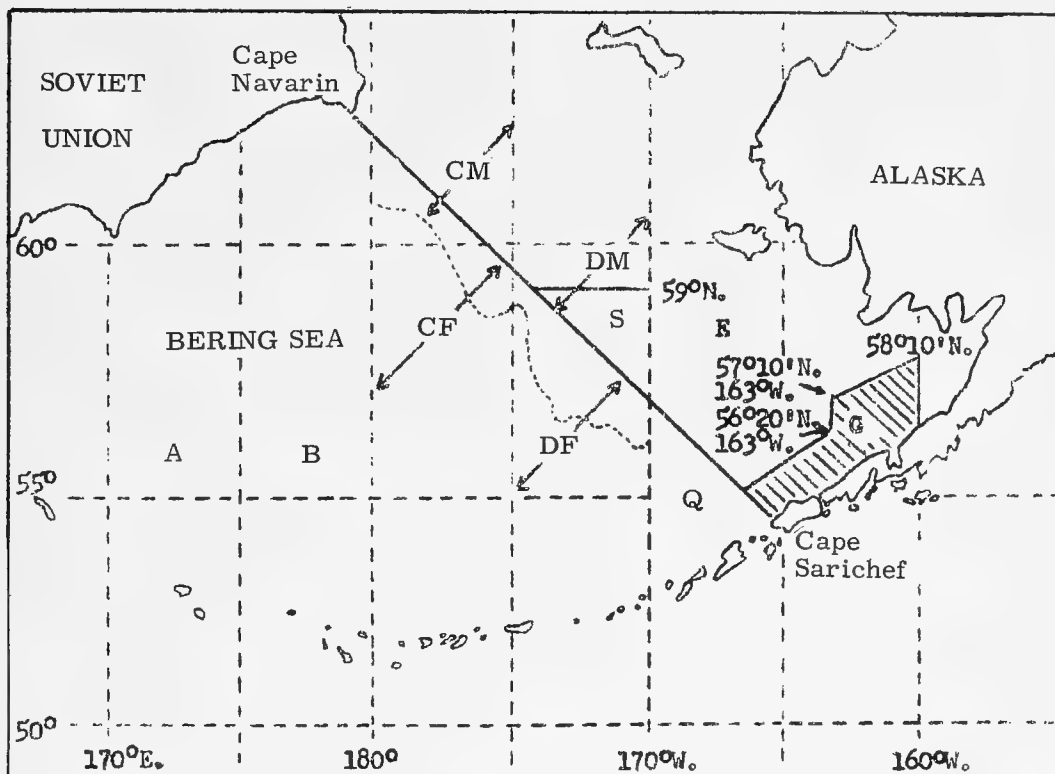
The advantages of Port Grande as a base are: (1) simplicity of quarantine and customs clearance, (2) labor is cheap, (3) tariffs are low, (4) suitable for anchoring, (5) it takes only four days to reach fishing grounds

and is located within short range of a seasonal fishery for yellowfin and big-eyed tuna, and (6) overtime is available. Among the defects are: (1) prices of commodities are high including water and provisions, and (2) there are only a few repair shops available. (Japanese newspaper, February 1, 1963.)

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BERING SEA BOTTOMFISHING AREAS SET FOR 1963:

A total of 19 motherships (includes 2 winter fleets), accompanied by 252 catcher vessels and 8 portable catcher vessels, will be permitted to conduct bottomfishing in the Bering Sea in 1963, the Japanese Government announced on February 26, 1963. This represents a substantial reduction in fleet size compared to 1962.



Based on the area division, fishing areas shall be assigned as follows:

A. Mothership-type bottom trawl fishery:

- (1) Fish meal factoryship - Areas CM, IM, and E.
- (2) Fish-meal-oil factoryship - Areas CF, DF, and Q.
- (3) Freezer factoryship - Areas A, B, CF, DF, Q, and S.
- (4) Closed to trawling - Area G.

B. Mothership-type long-line and gill-net fisheries: Mothership fleets operating long lines and gill-nets are authorized to operate in Areas A, B, and CF.

Japan (Contd.):

The 1963 Bering Sea area license regulations are:

1. Between 180° longitude and 170° W. longitude at depths of less than 150 meters (492 feet) and the area east of 170° W. longitude and north of the line extending from Cape Navarin to Cape Sarichef, Unimak Island (hereafter referred to as the Navarin-Sarichef line), 2 motherships and 47 catcher vessels (1 mothership under 10,000 gross tons accompanied by 17 catcher vessels, and another mothership of 10,000-12,000 gross tons accompanied by 30 catcher vessels) will be licensed for operation.

2. East of 180° longitude and south of the Navarin-Sarichef line, one mothership under 12,000 gross tons accompanied by 27 catcher vessels will be licensed for operation.

3. East of 170° E. longitude and west of 180° longitude, as well as east of 180° longitude and west of 175° W. longitude but south of the Navarin-Sarichef line, 5 motherships, each under 4,000 gross tons, and 24 catcher vessels (1 mothership under 500 tons accompanied by 2 catcher vessels, 1 mothership over 500 tons but under 650 tons accompanied by 2 catcher vessels, 1 mothership over 650 tons but under 800 tons accompanied by 3 catcher vessels, 1 mothership over 800 tons but under 2,000 tons accompanied by 5 catcher vessels, and 1 mothership over 2,000 tons but under 4,000 tons accompanied by 12 catcher vessels) will be licensed for operation.

4. East of 170° E. longitude and south of the Navarin-Sarichef line, and in the triangular area bound by the Navarin-Sarichef line and latitude 59° N. and longitude 170° W., 9 motherships, each under 12,000 gross tons, and 135 catcher vessels (1 mothership under 700 tons accompanied by 2 catcher vessels, 1 mothership over 700 tons but under 1,500 tons accompanied by 5 catcher vessels, 1 mothership over 1,500 tons but under 2,500 tons accompanied by 12 catcher vessels, 1 mothership over 2,500 tons but under 3,500 tons accompanied by 9 catcher vessels, 1 mothership over 3,500 tons but under 4,500 tons accompanied by 14 catcher vessels, 1 mothership over 4,500 tons but under 6,000 tons accompanied by 18 catcher vessels, 1 mothership over 6,000 tons but under 9,000 tons accompanied by 28 catcher vessels, 1 mothership over 9,000 tons but under 11,000 tons accompanied by 21 catcher vessels and

carrying 6 small portable fishing vessels, and 1 mothership over 11,000 tons but under 12,000 tons accompanied by 26 catcher vessels and carrying 2 portable vessels) will be licensed for operation. (Suisan Keizai Shimbun, February 27, 1963.)

Note: See Commercial Fisheries Review, June 1962 p. 56.

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BERING SEA KING CRAB REGULATIONS FOR 1963 ANNOUNCED:

The Japanese Fisheries Agency announced on January 21, 1963, king-crab fishing regulations for the Bering Sea. According to this announcement, the Agency will permit the packing of canned king crab by those companies which were previously licensed to pack frozen king crab only. Instead of the split two-season system (spring and fall), there will be only one fishing season extending from April to November 30.

In previous years, king crab freezer vessels operating in the eastern Bering Sea in the fall were not permitted to operate in the area fished in spring and summer by the canned crab factoryship Tokei Maru. This area restriction will be abolished.

For 1963, the Fisheries Agency is licensing the operation of two king crab canning factoryships. They are to be operated by two groups, designated as A and B. The quota for Group A (consisting of five firms) is 115,000 standard cases (6-1/2-oz. 48 cans/cs.) and the quota for Group B (consisting of four firms) is 120,000 standard cases.

Some companies had requested increases in their production quota for 1963, but the Agency reportedly is not granting any in view of indications that the eastern Bering Sea king crab resource is declining. As evidence, the Agency is said to have cited the following reasons:

1. Studies conducted with experimental fishing nets have revealed that the catch-per-unit of "tan" (Japanese unit of king crab net) has declined from 13.7 male crabs in 1960 to 7 crabs in 1961, and to 4.1 crabs in 1962.

2. Net soaking time (number of days that gear is left in water before hauling) has increased. Although the catch-per-unit of "tan" for the Japanese commercial fleet has not changed substantially, it has been maintained by increasing net soaking time. Data from the king crab factoryship Tokei Maru show that net soaking time has increased from an average of 7-10 days in 1957 to 18 days in 1962.

3. Size of the commercially-caught king crab is getting smaller, indicating a decline in the average age of commercial-sized king crab. Past data show that the average body size of king crab in the eastern Bering Sea, as measured by carapace length, has declined from 170 millimeters (6.7 inches) in 1953 to 161 millimeters (6.3 inches) in 1959, and to 158 millimeters (6.2 inches) in 1962.

4. The tanner crab--a competitive species to the king crab--are migrating northward. They can be considered as having invaded the habitat of the king crab, as the king crab declined in abundance.

5. King crab attain commercial size after eight years. Thus, high catches can be maintained for a number of years even in cases when stocks are overfished, for high catches do not immediately affect recruitment. However, if the brood stock continues to decline in abundance and this effect is manifested in recruitment, then the resources will decline rapidly and will take a very long while to recover.

The Japanese fishing companies are reported to have requested that the fishing season be advanced 15 days, to commence from March 15, and it appears that the agency will act favorably on this request.

Japan (Contd.):

The fishing companies in Group A are reported to be planning on dispatching the factoryship *Dainichi Maru*, while those in B are expected to utilize the factoryship *Tokei Maru*. (Suisan Keizai Shimbun, January 22 and 24; *Suisan Tsushin*, January 22, 1963.)

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FISHERIES AND LICENSING POLICIES DESIGNATED BY CENTRAL FISHERIES COORDINATION COMMISSION:

The Japanese Government's Central Fisheries Coordination Commission (which serves in an advisory capacity to the Minister of Agriculture and Forestry on such matters as licensing and fishing regulations) approved on January 16, 1963, the draft of the ordinance relating to designation of the Japanese fisheries into 18 categories and the licensing policy governing each of the 18 fisheries.

The 18 designated fisheries and vessel requirements for each of the 18 fisheries were made public on January 16. Regulations concerning the licensing policy for each of the 18 fisheries were publicly announced on February 1, when they became effective. Press reports indicated that the regulations were severely criticized by different segments of industry.

The 18 designated fisheries and vessel requirements are listed below. The term Pacific Ocean includes the Bering Sea, Okhotsk Sea, Japan Sea, Yellow Sea, and East China Sea.

1. Offshore Bottom Trawl Fishery: Bottom trawl fishery (excluding the bottomfish fisheries specified in Items 5 and 17) conducted with powered fishing vessels over 15 tons gross in the Pacific Ocean north of 25° N. latitude, west of 153° E. longitude, and east of the line beginning from the Korean mainland south along 128°30' E. longitude until it intersects 34° N. latitude, and connecting the points 34° N. latitude-128°30' E. longitude; 33°9'15" N. latitude-128° E. longitude; 33°9'15" N. latitude-128° E. longitude; and 33°9'15" N. latitude-128°30' E. longitude, and extending south along longitude 128°30' E. south of latitude 33°9'15" N.

2. East China Sea Bottom Trawl Fishery: Bottom trawl fishery (excluding the bottomfish fishery specified in Item 5) conducted with powered fishing vessels over 15 tons

gross in the Pacific Ocean north of 25° N. latitude and west of the line described in Item 1.

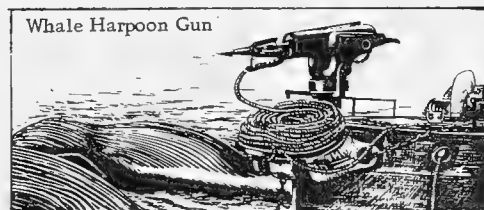
3. Distant-water Trawl Fishery: Bottom trawl fishery (excluding the bottomfish fishery specified in Items 5 and 17) conducted with powered fishing vessels over 15 tons gross in the Pacific Ocean, but not including the area north of 25° N. latitude and west of 153° E. longitude.

4. Northern Water Long-line and Gill-net Fishery: Long-line and gill-net fisheries (excluding those fisheries specified in Item 5 and Items 11-17) conducted with powered fishing vessels in the Pacific Ocean north of 50° N. latitude and east of 170° E. longitude.

5. Mothership-type Bottomfish Fishery: Bottom trawl, long-line, and gill-net fishing operations (excluding those fisheries specified in Items 12, 13, 16, and 17) conducted by mothership fleets. A mothership is a vessel equipped with production, refrigeration, and processing facilities, and is accompanied by a fleet of catcher vessels, as specified in Paragraph 1, Article 52 of the Japanese Fishery Law.

6-7. Large- and Medium-Class Surrounding Net Fishery: Surrounding net fishery conducted with powered fishing vessels over 40 tons gross. However, in the area south of the line running due east from the point midway between Cape Esan in southeast Hokkaido and Cape Shiriya in Aomori Prefecture and east of the line running due south from the lighthouse at Cape Nojima in Chiba Prefecture, the surrounding net fishery conducted with powered vessels over 15 tons gross.

8. Large Whale Fishery: Whaling operations (excluding the whale fishery specified in Item 10) conducted with powered fishing vessels equipped with harpoon guns for harvesting whalebone whales (excluding Minke's whale) and sperm whales.



9. Small Whale Fishery: Whaling operations (excluding the whale fishery specified in Item 10) conducted with powered fishing

Japan (Contd.):

vessels equipped with harpoon guns for harvesting Minke's whale or toothed whales (excluding sperm whales).

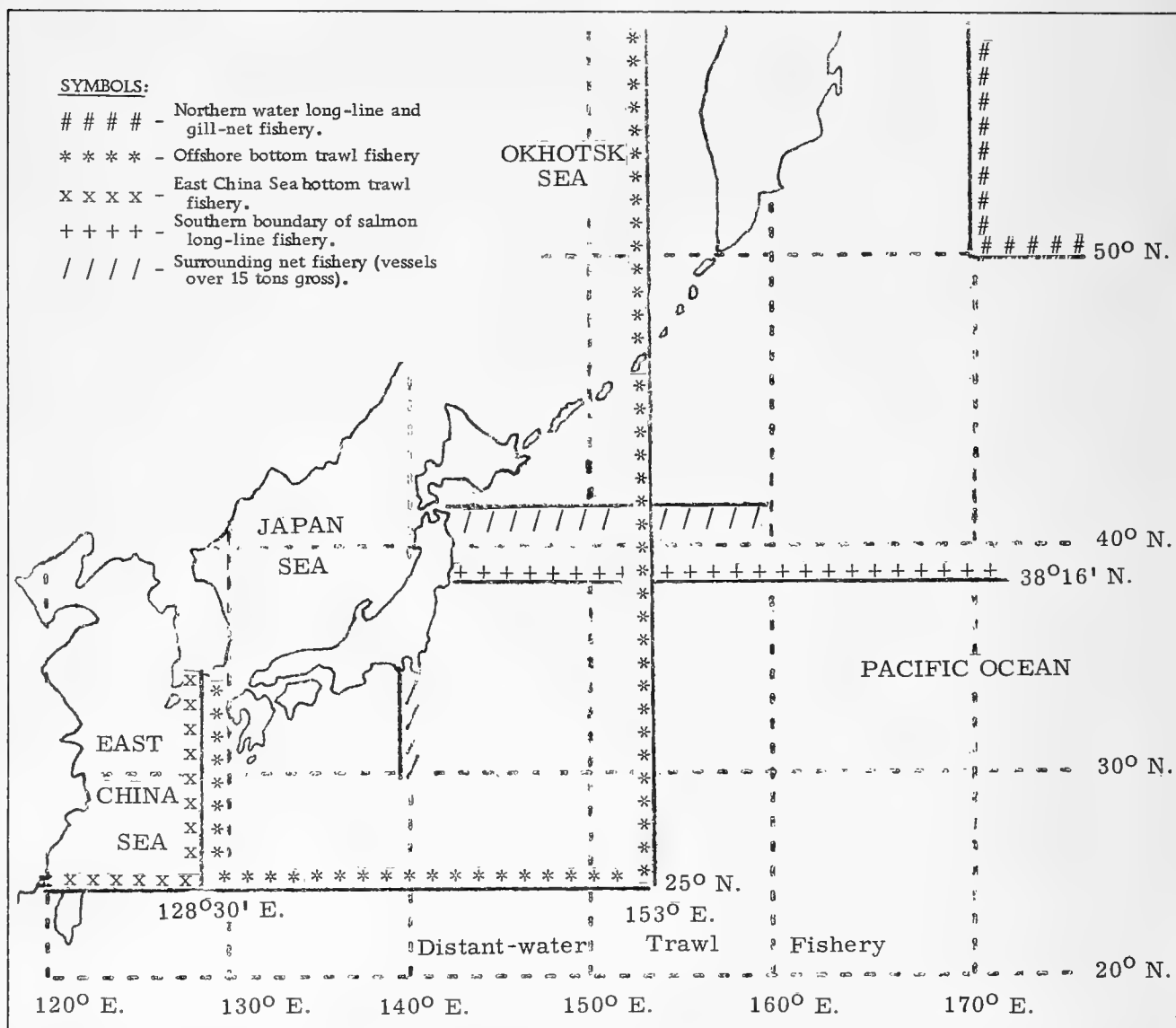
10. Mothership-type Whale Fishery: Mothership-type whaling operations in which harpoon guns are used to harvest whales.

11. Distant-water Tuna Fishery: Long-line and pole-and-line fisheries (excluding the fisheries specified in Items 12 and 13) conducted with powered fishing vessels (over 40 tons gross) for harvesting tuna, spearfish and shark. (Tuna vessels in the 40-99 ton range were formerly classified as medium-

class tuna vessels and those over 100 tons as distant-water vessels.)

12. Portable-vessel-carrying Mothership-type Tuna Fishery: Mothership-type fishery conducted with powered portable catcher vessels for harvesting tuna, spearfish, and shark with long-line or pole-and-line gear. (Portable catcher vessels are normally carried by the mothership except during actual fishing operations.)

13. Regular Mothership-type Tuna Fishery: Mothership-type fishery conducted with catcher vessels (other than portable catcher vessels) for harvesting tuna, spearfish, and shark with long-line or pole-and-line gear.



Areas of operations of certain Japanese fisheries.

Japan (Contd.):

14. Medium-class Drift Gill-net Salmon Fishery: Drift gill-net salmon fishery (excluding mothership-type fishery specified in Item 16) conducted with powered fishing vessels over 30 tons gross.

15. Medium-class Long-line Salmon Fishery: Long-line salmon fishery (excluding mothership-type salmon fishery specified in Item 16) conducted in the Pacific Ocean north of 38°16' N. latitude (excluding Japan Sea) with powered fishing vessels over 10 tons gross.

16. Mothership-type Salmon Fishery: Mothership-type fishery connected with the taking of salmon.

17. Mothership-type Crab Fishery: Mothership-type fishery connected with the taking of king crab and Abura crab.

18. Shellfish Fishery: Fishery conducted with powered fishing vessels over 20 tons gross for harvesting certain designated species of shellfish with diving equipment.

Vessel requirements for the designated fisheries listed above are as follows:

1. Northern Water Long-line and Gill-net Fishery: Vessel must be over 100 tons gross.

2. Mothership-type Bottomfish Fishery: Motherships must have refrigeration equipment. Catcher vessels must be over 50 tons gross.

3. Large Whale Fishery: Catcher vessels must be over 100 tons gross and equipped with direction finder.

4. Mothership-type Whale Fishery: Motherships must be over 10,000 tons gross and equipped with whale processing and whale-oil manufacturing facilities, as well as with direction finder, loran, and radar. Catcher vessels must be over 300 tons gross and equipped with radar and direction finder.

5. Portable-vessel-carrying Mothership-type Tuna Fishery: Motherships must have refrigeration equipment. Portable fishing vessels must be under 20 tons gross.

6. Regular Mothership-type Tuna Fishery: Motherships must be over 3,000 tons gross and have refrigeration equipment.

7. Medium-size Salmon Drift Gill-net Fishery: Vessels must be equipped with direction finder, and with either wireless or radiophone.

8. Medium-size Salmon Long-line Fishery: Vessels must be equipped with direction finder and with either wireless or radiophone.

9. Mothership-type Salmon Fishery: Motherships must be over 5,000 tons gross and equipped with refrigeration and canning facilities, direction finder, loran, and radar. Catcher vessels must be over 50 tons gross and equipped with direction finder and with either wireless or radiophone.

10. Mothership-type Crab Fishery: Motherships must be over 2,000 tons gross and equipped with automatic counter, canning equipment, direction finder, loran, and radar. Catcher vessels must be over 50 tons gross and equipped with direction finder and with either wireless or radiophone. (Nihon Suisan Shimbun, January 18 and February 2, 1963; and other sources.)

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INDUSTRY MISSION SEEKS FISHERY AGREEMENT WITH COMMUNIST CHINA:

A 5-man fishing mission led by the president of one of the largest Japanese fishing companies (also chairman of the Japan-Communist China Fishery Council), returned to Tokyo, February 2, this year, after a 3-week visit in Communist China. At an airport press conference the Mission's leader predicted that a private Japan-Communist China fishery agreement would be signed next fall.

While in Peiping, the Mission signed a memorandum with the Communist Chinese in which the parties confirmed the possibility of concluding private agreements between Japan and Communist China on fishing problems, the desirability of meeting again before the end of the year to discuss fishery problems in the Yellow and East China Seas, and their intention to carry out technical exchanges on fishery matters.

The last private agreement between Japan and Communist China was entered into in 1955 and was renewed annually until 1958 when it expired as a result of the breakdown in Japan-Communist China trade relations. The 1955 agreement established six fishing zones off the Chinese mainland, limited the entry into those zones of Communist Chinese and Japanese fishing vessels, and provided for emergency ports of call.

Japan (Contd.):

Although the memorandum is little more than a statement of intentions, it has significance in that it represents the establishment of one more in the growing number of contacts between the Japanese and Communist Chinese. (United States Embassy, Tokyo, February 21, 1963.)

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MIDWATER TRAWLING FOR SHRIMP SHOWS PROMISE:

Excellent results have been reported from a new midwater trawl fishery for shrimp. Large quantities of shrimp are now caught in the East China, Yellow, and Bering Seas, and the North Pacific by both pair trawlers and side trawlers. These vessels tow large polyethylene knotless nets which have a headline spread of up to 200 feet (250 feet at the footrope) for the pair trawlers, and up to 160 feet headline spread for an 850 hp., side trawler. Each pair trawler has an engine of about 350 hp.

This new fishery, in which the shrimp are taken 10-15 fathoms from the bottom, has been developed entirely through the use of the highly sensitive 200 kilocycle echo sounder, which is very efficient up to depths of 100 fathoms. Over half the echo sounders sold in Japan during the past 12 months have been of this high frequency type, although some firms are offering sets which are adaptable from 200 to 50 kilocycles. Many of the vessels which are fishing for shrimp are fitted with a "Net-sonde" telemetering device attached to the mouth of the trawl.

The doors in use with the big four-seam nets are high curved boards which are claimed to offer less resistance. (World Fishing, January 1963.)

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NEW STERN-TRAWLER TRAINING SHIP:

The new Japanese training ship Oshoro Maru, built for Hokkaido University by an Osaka shipyard, has the features of a modern stern-trawler. The 1,150-ton vessel can also be used to train fishermen in drift-net and long-line fishing. In recent years, the Japanese have built a number of training ships in order to give their fishermen a sound background in the use of modern navigational and fishing equipment. The Oshoro

Maru has accommodations for 60 trainee-cadets and 9 fishery instructors, as well as a normal complement of 12 officers and 27 crewmen. The extra accommodations were provided by limiting the fish-holding space of the vessel to 46 cubic meters (60.1 cubic yards).

The main dimensions of the vessel are: length between perpendiculars 60.5 meters (198.4 feet); breadth 11.0 meters (36.1 feet); molded depth 5.4 meters (17.7 feet). It is powered by a Diesel engine of 2,000 h.p. at 260 r.p.m., giving a maximum speed of 14.5 knots and a cruising speed of 12.5 knots. Fuel-oil tanks have a capacity of 327 cubic meters (427.7 cubic yards). Fresh-water tanks have a capacity of 246 cubic meters (321.7 cubic yards). The fish hold is refrigerated by two 20 h.p. Freon units.

The vessel's oceanographic equipment includes three powerful sounding machines and a geomagnetic electro-kinetograph. (Fishing News, December 21, 1962.)

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ANTARCTIC WHALING FLEETS ATTAIN ONE-THIRD OF QUOTA:

During the 1962/63 whaling season the Japanese had seven fleets operating in the Antarctic. The 7 fleets, which are owned by 3 Japanese fishing companies, were allotted 6,111 blue-whale units (873 units for each firm) at the July 1962 meeting of the International Whaling Commission. A blue-whale unit equals 1 blue whale, or 2 fin whales, or 2½ humpback whales, or 6 sei whales.

At the July 1962 International Whaling Commission meeting, a basic quota of 15,000 blue whale units was set as the allowable catch for the five Antarctic whaling nations. Originally, Japan was allocated 33 percent of the over-all quota, but the quota was increased to 41 percent upon the acquisition of 2 whaling fleets, one each from the United Kingdom and Norway. Calculated on this basis Japan's 1962/63 allotment of the over-all quota was 6,150 blue-whale units. It was agreed, however, that The Netherlands would receive, in addition to its 6 percent of the 15,000 units additional bonus units from the Japan, United Kingdom, and Norway quota. In order to meet this obligation Japan set a quota of 6,111 units for its Antarctic fleet.

From the beginning of the baleen whaling season on December 12, 1962, to January 26,

Japan (Contd.):

1963, the Japanese fleet had captured 4,478 baleen whales (4,443 finbacks, 138 seis and 7 humpbacks). In terms of blue whale units the fleet had taken about 36 percent of its allocated quota of 6,111 units on January 26.

The fleet had taken 1,629 sperm whales prior to January 26 this year. The catch of this species is not restricted by the International Whaling Commission. (Fisheries Attache, United States Embassy, Tokyo, February 1, 1963.)



Republic of Korea

MODERN FISHING VESSELS TO BE OBTAINED FROM ITALIAN-FRENCH GROUP:

On January 21, 1963, six Italian and two French businessmen signed a contract with the Government of the Republic of Korea to supply Korea with 159 modern fishing boats valued at approximately US\$58 million. The Italian group will provide about \$26 million of equipment including marine motors and other machinery. The French firm will supply equipment valued at about \$32 million, including vessel hulls and fishing equipment. (United States Embassy, Seoul, January 26, 1963.)



Morocco

FISHERY PRODUCTS INCLUDED IN TRADE AGREEMENTS:

During 1962, the Government of Morocco concluded or extended bilateral trade agreements with a number of countries. Many of the agreements included provisions for trade in such fishery products as fish meal, canned sardines, fresh fish, frozen sardines, oysters, and other fishery products. Under the agreements, Morocco will export fishery products to 18 countries, and will import fishery products from 6 countries. (United States Embassy, Rabat, December 19, 1962.)



Netherlands

AGREEMENTS ON ANTARCTIC WHALING SUBMITTED TO PARLIAMENT:

On January 13, 1963, The Netherlands Government submitted the text of two whaling agreements to Parliament for ratification. These agreements, signed on June 6, 1962, provide for an allocation among the signatory countries of the maximum number of blue whale units to be caught by each in Antarctic waters. The Netherlands is allocated 6 percent of the total (15,000 blue whale units) and may under certain conditions be able to catch more. A public debate on these agreements in the Second Chamber has been requested by the Socialist Party.

The Netherlands Whaling Company has announced that the 1962/1963 season got off to a relatively good start, with whale oil production so far running considerably ahead of 1961-62. (United States Embassy, The Hague, January 26, 1963.)

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TRAWLERS TO ENTER DISTANT-WATER FISHERIES:

Under a new project supported by the Netherlands Government, about 10 Dutch trawlers will soon be fishing off Iceland, the Lofoten Islands, and in the White Sea. The trawlers, which will fish for cod, whiting, haddock, and other fish in those areas, will receive a Government subsidy of one million guilders (US\$278,000) annually for the next three years.

The first Dutch trawler to take part in the project left early in February to fish off Iceland. One fishing firm in IJmuiden is reportedly planning to purchase 6 large stern trawlers from Poland, which it intends to use off Iceland, in the Bering Sea, and possibly off Newfoundland.

The entire project is meeting opposition from Dutch fishermen, however. The three principal fishermen's unions have advised their members not to sign on trawlers sailing to those new areas. (U.S. Embassy, The Hague, February 9, 1963.)



New Hebrides

EXPORTS OF FROZEN FISH, 1958-1962, AND FISHERY TRENDS, EARLY 1963:

The New Hebrides in the South Pacific gained an important new export industry in 1958 when a fish freezing plant was established in Palekula near Santo. Since then, their exports of frozen fish (mainly tuna) have been: 1958--3,509 metric tons; 1959--3,710 tons; 1960--4,133 tons; 1961--3,675 tons; and 1962--4,289 tons. The value of their 1962 frozen fish exports was estimated at £470,000 (US\$1,316,000). The United States received about 84 percent of the total exports of frozen fish from the New Hebrides during 1958-1962, with most of the remainder going to Japan and France.

In 1963, an estimated 7,250 tons of frozen fish will be produced at the Palekula plant which is being expanded. In addition, the wooden wharf at the plant will be replaced with a concrete dock where 450-ton vessels can land. The plant is operated by a joint Japanese-United States-Australian company.

The base employs 40 Japanese and 75 local workers ashore. It is served by 11 Japanese long-liners manned by crews of 23 to 25 men. The vessels usually spend 25 days at sea. Their catch averages about 55 percent albacore, 15 percent yellowfin, and 5 percent bigeyed tuna. The remainder of the catch consists mostly of black marlin, swordfish, and sharks.

The Japanese vessels in the New Hebrides fish their long lines to a depth of 200 meters (656 feet). Baited hooks are set on each long line at intervals of 20 meters (65.6 feet). On the average, only $3\frac{1}{2}$ percent of the baited hooks can be expected to take fish, according to an Australian investor in the Palekula base. He said that the efficiency of United States tuna vessels using purse seines and power blocks had reduced United States tuna prices and made it more difficult for his company to compete in the United States market.

The Government of the New Hebrides imposes a general 3 percent export tax on frozen fish, and an additional 3 percent levy on shipments to France as a charge for a certificate of origin. The New Hebrides authorities have waived the $17\frac{1}{2}$ percent import duty on equipment brought in to operate the shore base at Palekula. Negotiations

were going on in early 1963 to reduce the import duty on long lines and other fishing gear used in the fishing operation. (United States Consulate, Suva, February 24, 1963.)

Note: See Commercial Fisheries Review, June 1960 p. 57.



New Zealand

FIRM CONSIDERS BUILDING FREEZE-DRYING PLANT FOR FISH:

An Invercargill, New Zealand, firm which owns what is claimed to be the only commercial size accelerated freeze-drying plant for meat in the Southern Hemisphere, is considering building a plant at Timaru to freeze-dry fish.

The plant's managing director claims to have made some highly successful experiments in the freeze-drying of minced fish, oysters, and crayfish. He also claimed that potential overseas markets exist for his products.

Plans by the New Zealand firm include the offering in 3 or 4 years, of an "Accelerated Freeze-Drying Plant" suitable for installation aboard vessels to process fish at sea. Such installations would enable vessels to land much larger catches without the need of refrigeration.

Accelerated freeze-drying of food (cooked or uncooked) is a method of freezing and then drying in a vacuum. The frozen moisture is converted directly to water vapor and evaporated as such, bypassing the liquid stage. It is claimed that this method of food preservation has the least adverse effect on flavor, texture, nutritive value, appearance, and color.

Shrimp have been preserved by freeze-drying in the United States for several years. (Australian Newsletter, December 1962.)

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NEW FISH EXPORTING COMPANY PLANNED IN AUCKLAND:

A new fishing company working exclusively for the export market will be organized in Auckland, New Zealand, with a paid up capital of £125,000 (US\$350,000), according to plans announced in late 1962. The proposed new company hopes to have 4 large trawlers and 2 medium-sized vessels operating with-

New Zealand (Contd.):

in 2 years. Under the organization plan, the public will be offered 154,500 shares at 10s. (\$1.40) par in the new firm. The remaining 95,500 shares will be issued to shareholders in a frozen food distributing firm which will become a wholly-owned subsidiary.

The distributing firm that will become a subsidiary has shipped New Zealand fish by air to the Sydney Fish Market in Australia when prices have been attractive. The firm also ships sharks and shark livers to Australia and Malaya. In late 1962, the distributing firm acquired its own trawler, the 60-foot Southern Cross Stars. On its first trip for its new owner, the vessel returned with 200 sharks. (Fish Trades Review, Australia, December 1962.)

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SPINY LOBSTERS EXPORTED TO FRANCE:

In late 1962, a shipment of about 15 metric tons of frozen cooked spiny lobsters valued at over £5,000 (US\$14,000) was exported to France by three fishery companies in Dunedin, New Zealand, working in association with an Australian exporter. The shipment was aimed at expanding the market for New Zealand spiny lobsters to European countries, particularly France, Germany, and Switzerland.

Unlike the considerable quantity of New Zealand spiny lobsters exported to the United States in the form of raw frozen tails, the French shipment consisted of whole cooked spiny lobsters. They were cooked in boiling water for about 10 minutes and then cooled in cold water. After cooling, they were drained of surplus water and frozen in polyethylene bags. (Fishing News, December 21, 1962.)

**Nicaragua**LICENSE AND TAX PROVISIONS OF FISHERIES LAW:

A basic law designed to regulate the fishing industry was promulgated by Nicaragua under Decree 346 effective March 6, 1961. The law pertains to all fishing in the marine, continental, and insular waters that cover the continental shelf and underwater zones belonging to Nicaragua; fishing in internation-

al waters by vessels of Nicaraguan registry and vessels operating under Nicaraguan license; and fishing in lakes, bays, and rivers that are public property.

Following are important license and tax provisions under the law:

Commercial fishing licenses are granted by the Nicaraguan Ministry of Economy for a period not exceeding 20 years, although they may be extended for another 10 years. Only those enterprises which have constructed or plan to construct onshore installations in Nicaraguan territory will be considered for licenses. A plant must be of sufficient size and capacity to produce fishery products for the export market. This qualification will be determined by the Minister of Economy. If a plant is not constructed, the license will be canceled. Floating processing plants are prohibited from operating in Nicaraguan waters, but enterprises that produce exclusively for the Nicaraguan market are exempt from this provision of the law.

Requests for fishing licenses must contain detailed information on plans and plant capacity, amount and value of materials and machinery needed in construction, size and type of building to be used for the plant and related housing, method of financing, and vessels and fishing equipment to be used.

Prior to applying for a commercial fishing license, the requesting organization must make a deposit to the order of the Nicaraguan Treasury in the Banco Central de Nicaragua ranging from US\$500 to \$1,000. The amount of the deposit will be determined in each case by the Director General of Natural Resources. In addition, guarantee compliance with the obligations set forth in the license provided under the Natural Resource Law, a bond ranging from \$1,000 to \$10,000, will be required. The amount of the bond will depend on the importance and value of the enterprise to be licensed.

Fishing enterprises are taxed on the basis of the fishing capacity of the vessels belonging to the enterprise. Vessels up to 16 feet long and 4 feet wide are taxed \$10 annually. Larger vessels pay an additional annual fee of \$1 for each foot of length over 16 feet. Fishing enterprises are also subject to a Nicaraguan profits tax.

Holders of commercial fishing licenses are exempt from the payment of import duties and consular fees on all materials imported

Nicaragua (Contd.):

by them for fishing or for the improvement of their business. But each exemption must be requested individually from the Nicaraguan Customs office. Holders of commercial licenses are subject only to those taxes enumerated in the law. ("Investment in Nicaragua," Overseas Business Reports, December 1962, Bureau of International Commerce, U. S. Department of Commerce.)

Note: See Commercial Fisheries Review, June 1961 p. 76.



Norway

FISHERIES TRENDS, JANUARY 1963:

Whaling: In the first 32 days of the 1962/1963 whaling season, Norway's 4 Antarctic whaling expeditions processed a total of 76,800 barrels of oil, including 47,600 barrels of whale oil and 29,200 barrels of sperm oil. A year ago, Norway operated 7 Antarctic whaling fleets, which produced

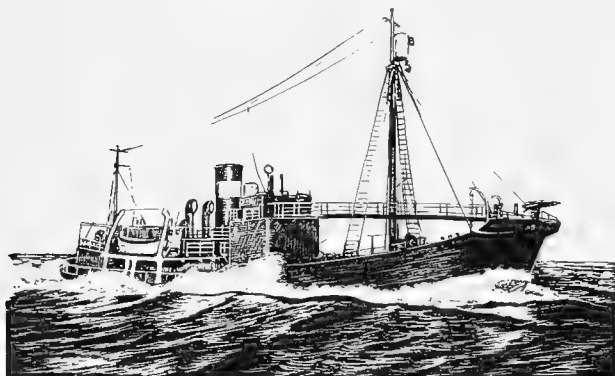


Fig. 1 - Type of catcher boat used by Norwegians during Antarctic whaling expedition.

114,875 barrels of oil, including 91,490 barrels of whale oil and 23,385 barrels of sperm oil, in the first 33 days of the 1961/1962 Antarctic season. Only four factoryships are active this pelagic whaling season as compared with seven in the 1961/62 season. Norway's quota of 32 percent of the total international quota of 15,000 blue whale units was reduced to 28 percent with the sale of the factoryship Kosmos III to Japan.

Lofoten Cod Fishery: The temporary ban against purse-seining in this fishery of North Norway will be extended through 1963.

Fisheries Economic Study: Thirty European fisheries researchers participated in an international seminar on fisheries eco-



Fig. 2 - Sorting the catch--Lofoten cod fishery.

nomics, held January 28-February 22, 1963, in Bergen, Norway, under auspices of the Norwegian School of Economics and Business Administration. (News of Norway, February 7, 1963 and United States Embassy, Oslo, February 12, 1963.)

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FISH-PROCESSING COMBINE ESTABLISHES DISTRIBUTION BASE IN THE NETHERLANDS:

A Norwegian combine of 160 fish-processing plants with its own fishing fleet has announced that it will establish a distribution center for frozen fish in Amsterdam, The Netherlands. This center, which will start operations in 1964, will supply all of the Norwegian sales organizations in Western Europe. The combine has similar distribution centers in the United States and Australia. (United States Embassy, The Hague, January 26, 1963.)

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FIRST STERN-FISHING FACTORY TRAWLER LAUNCHED:

Another step forward in the modernization of Norway's distant-water fishing fleet was taken when the Longva, the first stern-fishing factory trawler to be built in Norway, was handed over to her owners.

The 1,092 gross ton vessel is equipped to produce frozen fillets, animal food, salt cod, and cod liver oil. She has the following main dimensions: length over-all 208 feet (175 feet between perpendiculars), breadth moulded 32 feet 10 inches, depth to main deck 16 feet 1 inch, and depth to shelterdeck 23 feet 8 inches. The vessel is smaller than the British and other vessels upon which she was modeled and her layout is extremely compact.

Norway (Contd.):

Everything seems to have been done to provide the largest possible storage capacity, with the result that the vessel will be able to land about 400 tons of frozen fishery products per trip.

One of the methods employed to obtain that storage capacity has been the positioning of the engineroom at the extreme aft end of the ship. Increased crew accommodation space has been obtained by fitting a whale-back--an unusual feature on a stern trawler. The position of the engineroom has been a contributing factor to the layout of the bridge superstructure. Two extensions to the bridge enclose the forepart of the trawl deck and house the 2 lifeboats and engine exhausts.

The vessel's main and aft masts are a quadpod and bipod respectively, giving the skipper an uninterrupted view of the trawl deck from the bridge.

The main purpose of the vessel will be to produce frozen packaged fish. The owner chose to produce animal food instead of fish meal, as there is a considerable saving in space in not installing a fish meal plant, while the resulting byproduct will meet with a stable market.

The factory deck procedure follows usual lines. After manual bleeding and cleaning, the fish are washed mechanically and passed to the two-line filleting machinery. This consists of 2 German made heading and filleting machines for fish of 50-120 centimeters (about 20-47 inches) in length and for fish of 40-70 centimeters (about 16-28 inches). These operate in conjunction with two skinning machines at a rate of 18-22 and 35-40 fish per minute, respectively. The fish are then taken on conveyor belts to three packing and weighing tables, and the loaded cartons then placed on trays for freezing in either a horizontal contact freezer or an elevator-type cold air freezer.

The Longva is powered by a 300 r.p.m., 1,500 hp. Diesel engine coupled to a controllable pitch propeller. Three auxiliary Diesels drive three 180 k.v. auxiliaries. A hydraulic trawl winch is part of the deck equipment.

Navigational aids include an echo sounder and a fischlupe, plus a radio, two radars,

ASDIC, gyro, autopilot, and electronic log. (World Fishing, February 1963.)

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LOFOTEN COD FISHERY ATTRACTS FEWER VESSELS IN EARLY 1963:

Only about 900 fishing vessels were on North Norway's Lofoten cod banks when the fishery opened early in 1963. A total of 2,836 vessels and 9,681 men took part in the fishery in 1962, according to a final report. In good seasons in the past, 30,000 men participated in the fishery. (News of Norway, February 14, 1963.)

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PROPOSED INCREASE IN FISHING VESSEL CONDEMNATION SUBSIDY:

The Norwegian Government has proposed a supplementary appropriation of Kr. 5 million (\$700,000) to subsidize condemnation of outmoded fishing vessels. It has also proposed that the Fishermen's Bank be authorized to increase this year's condemnation subsidy grants by Kr. 2 million (\$280,000). This would raise to Kr. 7 million (\$980,000) the limit on those grants. (News of Norway, February 21, 1963.)

Note: Norwegian kroner 7.15 equals US\$1.00.



Pakistan

KARACHI FISH HARBOR AND MARKET:

The Karachi fish harbor and market was opened on October 2, 1959. Built by the Government of Pakistan at an estimated cost of Rs. 15 million (US\$3.1 million), it has become an important fisheries center which has speeded the growth of West Pakistan's fisheries. The United States provided equipment valued at Rs. 2.5 million (\$0.5 million) and technical assistance to help build the harbor.

Karachi harbor was developed by building a jetty (1,740 feet long) and dredging a channel and turning basin, so fishing vessels could land directly at the market. Formerly, fishermen had to unload their catch on the open beach and then carry it miles to market by camel or donkey cart.

Buildings housing the Karachi fish market were built on 50-foot piles. The market complex now includes a wholesale fresh and dried

Pakistan (Contd.):



Fig. 1 - Dried fish ready for auction in the Karachi fish market.

fish market, cold storage and ice-making facilities, curing sheds, a workshop and slipway, a marine fisheries laboratory, net working sheds, offices and stores for the fishermen's cooperative society, rest rooms, a seafood restaurant and fishermen's cafe. It also includes housing for the principal staff of the market who must begin work at 3 a.m.

A certain amount of space at the market was set aside for private industry. So far, six fishery firms have located at the market with processing equipment to freeze, can, and dry fish, as well as extract shark liver oil.

A Government sponsored fishermen's cooperative society is the agent for the whole-sale distribution of fish at the market. Fish are actually sold by 24 auctioneers, known locally as "mole holders," who are licensed by the cooperative. A modest fee is charged for the service, half of which is paid to the

cooperative and half to the auctioneers. The auctioning system under the cooperative protects the fishermen from any squeeze on prices by middlemen and provides the cooperative with an income of Rs. one million (about \$0.2 million) a year, according to the Deputy Director of the Central Fisheries Department of Pakistan. Describing the disposition of



Fig. 2 - Fresh fish being auctioned in the Karachi market. The man with the document who is holding up his hand is one of the licensed auctioneers.

that income, he said, "Usually, some 5 to 15 percent is paid out by the society to the fishermen (about 1,600) all of whom are members of the cooperative. The rest of the money is used for the welfare of the fishermen, such as financing easy credit for the purchase of boats, engines, gear, and equipment; for building schools; bringing fresh water to the villages, looking after families in distress through death and injury; caring for the old and infirm; and providing scholarships for children."

In West Pakistan, fishery landings and exports, as well as fishermen's earnings have increased substantially since the market opened. A stable market for fish and easy credit terms have enabled some fishermen

Pakistan (Contd.):

to mechanize their vessels. In addition, new vessels are being built in boat yards on the open beach adjoining the new Karachi harbor. A Food and Agriculture Organization (FAO) representative reported that over 30 new



Fig. 3 - A Karachi fish buyer takes a closer look at the fish he has bid for successfully.



Fig. 4 - Shrimp sorting and handling at the Karachi market. Shrimp are a valuable part of Karachi's fishery landings.



Fig. 5 - Shrimp being processed in Karachi for freezing and packing for export.

mechanized fishing vessels 40 to 50 feet long, were being hand-constructed in those yards in early 1963. West Pakistan's fishing fleet of 5,000 vessels now includes 431 mechanized vessels. The Government has aided mechanization by exempting engines, fishing gear, and other equipment from certain taxes.

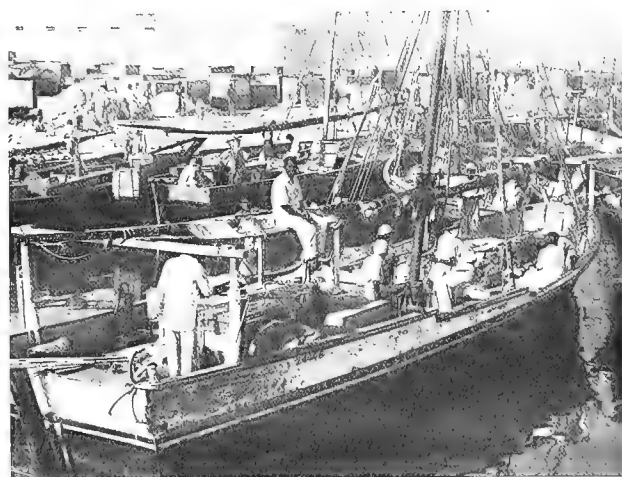


Fig. 6 - Mechanized fishing vessels alongside the landing dock of the Karachi market.

The Deputy Director of the Central Fisheries Department said, "Mechanization of the boats and the use of nylon nets and other improved gear has had a big impact. Under sail alone, boats would take perhaps 8 hours to reach the fishing grounds and 8 to return, leaving only a third of the 24 hours for fish-

Pakistan (Contd.):

ing. Powered boats do the voyage in an hour each way and can fish for 22 hours a day.



Fig. 7 - Sail-powered Pakistani fishing vessels in foreground.

"Nylon nets," he continued, "are not only finer, more easily handled, and last 4 to 5 years against the 6 months of the local cotton nets, but also catch more fish."

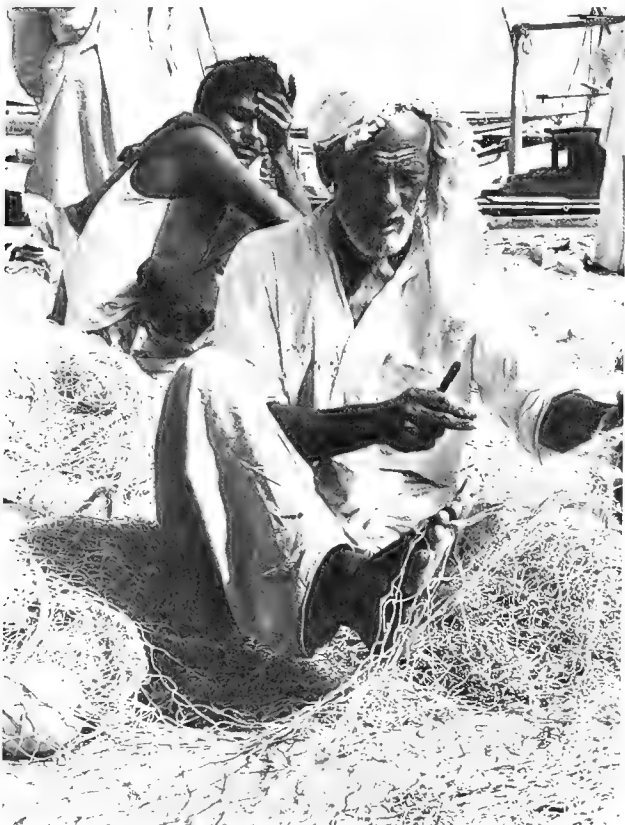


Fig. 8 - A veteran fishermen repairing his net.

But he pointed out that, although impressive progress has been made, there was still a lot of room for improvement. Less than 10 percent of West Pakistan's fishing fleet has been mechanized. Government plans to aid the fisheries include a project to bring roads and electric power to the Karachi boat building area. This would enable the builders to use power tools and machinery and cut their vessel construction time from 6 to 2 months.



Fig. 9 - Boat building in an open-beach yard near the Karachi market.

The Karachi boat yards hope to attract foreign orders. Their vessels are built of durable teak imported tax free from Burma. The cost of building a vessel in West Pakistan is one-half to one-third cheaper than in most countries. The Deputy Director said that FAO naval architects have carried out exhaustive tank tests on the vessel design used in Karachi and concluded that it cannot be improved.



Fig. 10 - A new fishing vessel ready for launching in Karachi. It will be pushed, hauled, and lifted to the sea by about 100 men.

Pakistan (Contd.):

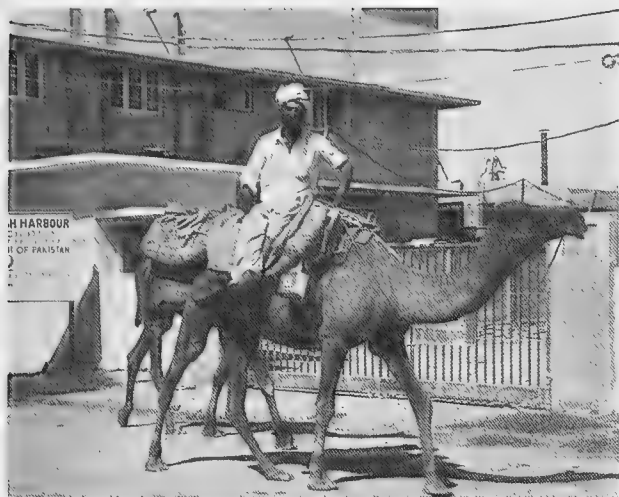


Fig. 11 - The old and the new in Karachi.

The Government also hopes to expand the domestic market for fish. At present, most of West Pakistan's fisheries catch is exported. Frozen shrimp and spiny lobster are shipped to the United States, canned shrimp is sold to the United Kingdom, and dried fish is marketed in India and Ceylon.

The Deputy Director said, "The main drawback to developing the domestic market has been the lack of distribution facilities. If we can organize quick distribution of fresh fish, I think we can develop the market, but to do this needs a well organized 'eat-more-fish' campaign, using all modern methods of education and persuasion. We're planning such a campaign for the future which will include a special drive to persuade children to eat more fish, and will demonstrate the tastiness of fish through the use of fleets of mobile fish fryers." (Features Section, Food and Agriculture Organization of the United Nations, February 10, 1963.)

Notes: (1) Pakistan rupee 4,782 equals US\$1.00.

(2) See Commercial Fisheries Review, January 1960 p. 82.

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NEW FIRM PLANS TO PACK AND EXPORT FROZEN FISHERY PRODUCTS:

A firm in Karachi interested in exporting frozen fishery products was going ahead with plans about the end of 1962, to install the latest quick-freezing and processing machinery. The firm will have the capacity to pack and freeze 3,600 metric tons of shrimp or 4,800 tons of fish fillets a year, and is reported to have made an agreement with a

leading United States importer of fishery products assuring the sale of its entire output. The Karachi firm expects to earn about US\$5.6 million in foreign exchange annually. It has an authorized capital of about \$1.1 million, with shares offered for public subscription. It has received the necessary licenses from the Government of Pakistan to import needed equipment. (Foreign Trade, Ottawa, December 1, 1962.)



Panama

SPINY LOBSTER EXPLORATORY FISHING PROJECT:

M/V "Pelican" Cruise 8 (December 6-20, 1962): A one-year exploratory survey for spiny lobsters along the Caribbean and Pacific coasts of Panama was started on August 27, 1962, when the M/V Pelican, a chartered commercial fishing vessel, arrived in Colon, Panama. The survey is being conducted by the U. S. Bureau of Commercial Fisheries through an interagency agreement with the U. S. Agency for International Development (AID) Mission to Panama as an Alliance for Progress program.



M/V Pelican, commercial fishing vessel under charter to U. S. Bureau of Commercial Fisheries for exploratory work off Panama.

The Pelican, which has been outfitted with specialized equipment for exploratory spiny lobster fishing, is a 72-foot steel hull shrimp vessel capable of 21 days of continuous operation, with accommodations for a 10-man crew and staff. A 17-foot outboard-powered skiff is available for shoal-water work.

During cruise 8, exploratory lobster fishing was extended along the southeastern Pacific coast of Panama and 97 trap stations were completed. A total of 568 traps was

Panama (Contd.):

fished for intervals of 1, 2, and 3 days, for a final fishing effort of 1,049 trap days. The highest catch rates were obtained in and near Santelmo Bay, Del Rey Island, where a 2-day 77-trap set during the dark-moon period yielded 33 spiny lobsters (*Panulirus gracilis*). During the full-moon period, a 3-day set of 69 traps yielded only 24 spiny lobsters. Spiny lobsters caught in the Del Rey Island area averaged 20 ounces in whole weight. The sex ratio was 1.3 male to 1.0 female.

Other areas fished during the cruise were San Jose Island, San Miguel Gulf, and Pinas Bay. Only one lobster was caught in an 84-trap set at San Jose Island. Thirty-six traps set in San Miguel Gulf produced no lobsters. Strong current conditions in that area complicated fishing trials. The Pinas Bay area produced 15 spiny lobsters in a 140-trap set.

The commercial lobster traps used during the cruise were made of wood slats, wire, and woven reed. The over-all catch rate (in number of lobsters per trap per day) of wood slat traps was twice as high as that for reed traps, and three times greater than the catch rate of wire traps.

Seven bottom trawling stations were sampled with a 40-foot shrimp trawl. Two drags near the trapping area at Del Rey Island caught 15 rock lobsters (China lobsters, Family Scyllaridae), but no spiny lobsters. The other drags were made in the Pinas Bay area and caught no spiny lobsters.

M/V "Pelican" Cruise 9 (January 21 to February 9, 1963): Explorations along the Caribbean coast of Panama were attempted during the first week of cruise 9, but severe sea conditions interfered with fishing operations. The Pelican crossed the Panama Canal on January 30, and Pacific explorations were continued in the Chiriqui Gulf around Parida, Bellanos, and Berracos Islands. Eighty trapping stations were sampled, using traps of wood slat, wire, and reed construction. A total of 477 individual sets were made with 1 to 3 traps fished at each set for a total effort of 823 trap days.

The traps caught a total of 148 spiny lobsters. The wood slat traps and the reed traps produced at about twice the catch rate (.2 lobster per trap day) as did the wire traps (.1 lobster per trap day). The highest catch

rate occurred on a 57-trap 3-day set which yielded 45 lobsters. The next highest rate was obtained on a 94-trap 2-day set producing 39 spiny lobsters. The whole weight of the lobsters averaged 21 ounces (males 22.7 and females 13.2). The sex ratio was 5 males to 1 female.

Bait used in the traps included shark and sawfish meat and trawl scrap. Crushed conchs were also used as an experimental bait. Bait trawling on a narrow strip of mud bottom between Bellanos and Parida Islands in 5 to 10 fathoms yielded 3 rock lobsters.

Initial trials with a 60-fathom nylon tangle net were unsuccessful in catching lobsters.

Fishing in the Chiriqui Gulf was conducted during the half- to full-moon period. Coverage of the area during the dark-moon phase was planned during Pelican cruise 10, which began February 20, 1963.

Note: See Commercial Fisheries Review, January 1963 p. 109.



Peru

FISH-MEAL INDUSTRY
CONTINUES TO EXPAND:

The anchoveta fishing season is at its height each year during a 6-8 month period beginning about October, and Peruvian fish-meal plants operated at full capacity in the fourth quarter of 1962. At times, plants had to refuse to buy fish from independent vessels because they could not process it with available equipment. Peru's total 1962 fish-meal production was 1,120,796 metric tons, according to data compiled by the National Fisheries Society, up 33 percent from the 1961 production of 839,800 tons reported by the Ministry of Agriculture. Many existing plants are doubling their facilities rapidly and numerous new plants will be coming into production within the next few months. With the increased capacity, another million tons could be added annually to Peru's fish-meal production by 1964. But one limiting factor is the availability of fishing vessels. Although local construction of fishing craft is a booming industry and some prospective buyers are even seeking vessels in other countries, the scarcity of fishing vessels is expected to restrict the increase in production. A conservative forecast of Peru's 1963 fish-meal production is 1,350,000 to 1,400,000 tons.

Peru (Contd.):

Total Peruvian fish-meal exports for 1962 are expected to be close to 1.1 million tons with a value of about \$110 million, a substantial increase over the 1961 fish-meal exports of about 708,000 tons valued at \$49.2 million.

In 1962, fish-meal prices were steady at about US\$100 per metric ton f.o.b. Peruvian ports. Some spot sales were made in November and December 1962 at \$109 f.o.b. Peruvian ports. (United States Embassy, Lima, January 24, 1963.)

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NEW TAXES INCREASE FISH-MEAL PRODUCTION COSTS:

It is estimated that new taxes levied by Peru will increase fish-meal production costs by about US\$10.00 per metric ton. A tax of about \$1.05 per metric ton on anchoveta used for industrial purposes was imposed by Government Decree No. 14265 effective the end of December 1962, according to the Fish Meal Exporters Organization. At a ratio of 5.6 tons of anchoveta to 1 ton of fish meal, the tax adds about \$5.90 to the cost of producing a ton of fish meal. In addition, a new tax has been imposed on fuel oil used in factories or for transportation, and taxes on income and profits have been increased. The fish-meal industry and other industries are protesting the taxes. A reduction of the taxes is hoped for but cancellation of them is not expected.

So far, there have been no reports of an increase in the price of Peruvian fish meal handled by the Consorcio Pesquero del Peru S. A. (Fisheries Consortium of Peru). The Consortium is the marketing agency for about 80 percent of Peru's fish-meal exports. In early January 1963, the Consortium actually dropped its prices slightly in London. Although it is believed that a substantial part of Peru's 1963 fish-meal production has been sold, the pressure of unsold stocks in the world market is influencing fish-meal prices. In spite of the situation, some Peruvian producers who do not belong to the Consortium have increased their fish-meal prices by \$2.50 to \$3.00 per ton. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 16, 1963.)



Portugal

TREND TOWARDS EXPANSION OF TERRITORIAL WATERS AFFECTS FISHERIES:

The following is a translation of an editorial published in the Portuguese periodical, Jornal de Pescador, February 1963:

It is public knowledge that fishing is being intensified throughout the world in view of the increasing consumption demand.

Studies are constantly being made, fishing methods improved, vessels developed both for greater speed and improved storage facilities, and large sums are being spent on such improvements as training of fishermen and oceanographic research.

One grave problem, however, arises which impedes profitable fishing. It is the problem of territorial waters which, as far as we Portuguese are concerned, affects us considerably. As concerns cod fishing, but more especially trawl fishing, our fleets encounter increasing difficulties every day. In fact, the countries in whose waters our vessels have traditionally operated are progressively increasing the limits of their territorial waters thus forcing us either to seek more distant fishing grounds, which, obviously prejudices our activities, or to diminish substantially the volume of our catches with ruinous results and a decrease in domestic supply.

It would appear that this problem should be carefully studied by our authorities since it is of the greatest importance to the national economy.

We are even tempted to think that the only favorable solution for the Portuguese would be to attempt separate arrangements with several countries whose maritime areas are included in our fishing activities.

How these arrangements are to be achieved is a matter for authorities at a higher level. We do know, however, that other countries have accomplished such arrangements either by mutual concessions or by means of paying for a fishing license or making indemnization payments. This procedure, of course, would be followed until such time as a more uniform and rational formula is found internationally for solution of the problem. (Translated by United States Embassy, Lisbon, February 13, 1963.)



Senegal

TUNA INDUSTRY TRENDS, DECEMBER 1962:

The French-Senegalese agreement for the November 1962 to May 1963 tuna-fishing season allows a quota of 10,000 metric tons of tuna to be canned in Senegal and exported to France under a special, duty-free provision (the French duty on imported canned tuna is 25 percent ad valorem). The 10,000-ton quota is to be filled exclusively by Senegalese and French boats. The Government of Senegal, which has no tuna vessels at present, has contracted to have 5 tuna vessels built in France for the Senegalese fleet, 2 of which should be ready to take part in next year's fishing.

The 10,000-ton tuna quota agreed to for the 1962/63 season corresponds with previous amounts allotted to Senegalese canneries--all French owned and operated. It falls far short of annual cannery capacity, estimated to be about 30,000 tons. No effort to fill the gap is to be made, although attempts in the past were made to sell to other than the French market. The French tuna clippers will be leaving as soon as the quota has been reached, and the Senegalese, as yet, have no other means of catching tuna. It is not known whether the canneries are expressly forbidden to purchase and can tuna taken by other than French or Senegalese craft.

On December 31, 1962, a total of 61 French vessels landed 450 tons of tuna at Dakar, the largest single catch ever unloaded at that port. This raised the current season's tuna catch to about 3,300 tons. On December 7, 1962, the tuna catch for the 1962/63 season amounted to 1,100 metric tons, compared with 120 tons on the same date the previous year. But only 21 vessels participated during the 1961/62 season when 7,000 metric tons of tuna were caught. (United States Embassy, Dakar, January 15, 1963.)



Taiwan

FISHERIES PRODUCTION INCREASES AGAIN IN 1962:

Production by the Taiwan fishing industry in 1962 amounted to an estimated 327,239 metric tons, an increase of 4.7 percent over the production of 312,439 tons in 1961. Since 1958 total production of fishery products has increased 42.5 percent.

Taiwan's Fishery Production, 1958-1962

Type of Fishery	1/1962	1961	1960	1959	1958
	(Metric Tons)				
Offshore and deep-sea fisheries	113,788	106,147	85,210	76,411	61,160
Outer coastal fishery	132,525	117,405	94,856	91,240	81,720
Inner coastal fishery	32,286	31,533	30,344	32,183	38,267
Fish culture and shellfish	48,640	57,354	49,030	46,493	48,530
Total	327,239	312,439	259,140	246,327	229,677
1/Estimated.					

The 1962 increase would have been larger had not fish culture production dropped as a result of the cholera epidemic. Production was also affected by depressed domestic fish prices which discouraged trawlers. By mid-January 1963, all of the 12 tuna long liners whose construction was started in December 1961 had been launched and a few will be put into service by February this year. Those vessels originally designed at 145 tons now range from 160 to 220 tons in order to permit the installation of freezing equipment.

During 1962, a Chinese fisheries firm put into service two new 550-ton tuna long-liners. Those boats are now operating in the west Indian Ocean. The firm estimates that exports in 1962 of frozen tuna amounted to 1,800 tons and expects to export about 3,400 tons in 1963. A small amount of frozen tuna and dolphin fillets were exported by independent fishing companies from Kao-hsiung during the year, and were handled by a Japanese firm. The Japanese firm has also signed a preliminary agreement with private boat owners to operate tuna boats in the waters off American Samoa. The catch will be processed by a cannery located on that island. Operations are expected to begin in July and as of February, about 15 Chinese fishing boats have been signed up. (United States Embassy, Taipei, February 1, 1963.)

Note: See Commercial Fisheries Review, March 1962 p. 55.



Turkey

TERRITORIAL WATERS AND FISHING LIMITS EXTENSION PROPOSED:

Legislation was introduced early in February this year to extend Turkish territorial waters from 3 miles to 6 miles and her fishing limits from 3 miles to 12 miles. (Fish Trades Gazette, February 9, 1963.)



U.S.S.R.

FISHERY DEVELOPMENT TRENDS, EARLY 1963:

Facilities for the Soviet fishing industry are included in the new port complex at Odesa on the Black Sea. The port has dock space for large ocean-going trawlers and even Soviet whaling vessels, including the 32,000-gross-ton mothership *Sovetskaya Ukraina*. Odesa also has a new fish-processing plant and a new refrigeration plant. (Various sources.)

U. S. S. R. (Contd.):

The Soviet Union was negotiating with a leading Japanese shipyard for a large number of fishing vessels when the Japanese Government indicated that the long-term credit extended to the Soviets by the shipyard was too liberal. (Press reports.)

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FISHING ACTIVITIES IN
GULF OF MEXICO AREA:

Since early October 1962, Soviet trawlers have been using the port of Veracruz, Mexico, for food supplies and to provide shore leave for their crews. Seven vessels have visited Veracruz, 2 of them on 2 separate occasions.

Local residents have talked to the Soviet crews, but the Soviets have always declined to speak directly about their fishing operations. The steel vessels are equipped for

However, no Cubans have been reported aboard the vessels upon their arrival at Veracruz. The vessels employ a crew of between 20-30 men, including technicians, instructors, and fishermen. The vessels measure 507 metric tons gross and 174 tons net. (United States Consulate, Veracruz, January 23, 1963.)

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LANDINGS, IMPORTS, AND EXPORTS OF
FISHERY PRODUCTS, 1960-1961:

Soviet fishery landings in 1961 amounted to 3.25 million metric tons, up 6.6 percent from landings of 3.05 million tons in 1960. Bottomfish landings, which showed the greatest increase, totaled 1.04 million tons in 1961, as compared with 0.94 million tons in 1960.

In size of catch, the Soviet Union ranked fourth among the world's fishing powers in 1961, surpassed only by Japan with a catch of 6.7 million tons, Peru with 5.2 million tons, and Mainland China with 5.0 million tons (estimated).

Soviet imports of fishery products in 1961 were down 48.8 percent in quantity and 38.4 percent in value from the previous year. A decline in imports of fresh and frozen fish and

Soviet Imports and Exports of Fishery Products, 1960-1961

Item	Imports				Exports			
	1961		1960		1961		1960	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
	1,000 Metric Tons	US\$ 1,000	1,000 Metric Tons	US\$ 1,000	1,000 Metric Tons	US\$ 1,000	1,000 Metric Tons	US\$ 1,000
Fish, fresh or frozen	18.7	5,117.0	58.1	13,675.0	-	-	-	-
Fish, dried, salted, or smoked	8.6	1,922.0	28.1	3,986.0	31.3	5,928.0	43.1	8,159.0
Fish products, in or not in air-tight containers	1/0.1	806.0	0.1	880.0	22.3	22,004.0	18.6	18,429.0
Shellfish products, in or not in airtight containers	-	-	-	-	3.7	9,435.0	3.7	8,598.0
Fish oils and fats	28.9	7,415.0	23.6	6,228.0	17.4	4,101.0	35.4	7,282.0
Fish meals and solubles	-	-	-	-	4.9	623.0	4.0	538.0
Total imports and exports of fishery products	56.3	15,260.0	109.9	24,769.0	79.6	42,091.0	104.8	43,006.0

1/Consists of caviar from Iran.

Source: Yearbook of Fishery Statistics, 1960-61, Vol. XIII, Food and Agriculture Organization of the United Nations.

side-trawling operations. However, no nets have been seen on the decks of the vessels.

It is reported that the vessels carry refrigeration equipment for preservation of the catch and processing is handled by a factoryship. The existence of such a factoryship has not been confirmed.

Mexican newspaper accounts state that one of the purposes of the trawler fleet is to establish a fisheries training facility in Cuba.

dried, salted, or smoked fish was only offset partly by an increase in imports of fish oil and fats.

Soviet exports of fishery products in 1961 dropped 24.0 percent in quantity and 2.1 percent in value from the previous year. There was a decline in exports of the lower-valued dried, salted, or smoked fish and fish oil and fats. But there was an increase in exports of the higher-valued canned and prepared fish products, most of which was shipped to countries in Eastern Europe. (Food and Agriculture Organization Feature.)

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U. S. S. R. (Contd.):

OFFICIAL CLAIMS FISHING FLEET IS WORLD'S LARGEST:

In an address before a conference of workers of the fishing industry in Riga, Latvia, the Chairman of the State Fishing Committee announced that the Soviet Union's fishing fleet was the largest in the world. He said that this fact has been acknowledged by the United States and Norway which are countries with highly developed fishing industries. He claimed that the Soviets have modern vessels which can catch and process fish, whales, and other marine products over a period of 6 or more months without entering port. Moreover, the vessels are equipped with refrigeration which enables them to operate in both the equatorial Atlantic as well as in the North Atlantic, the Arctic, and Antarctic.

In the next few years, the Soviet fishing fleet is due to be supplied with modern refrigerator ships and floating factories. Most are to be of Soviet construction; however, some of the new vessels will be made under special agreements in West Germany, Denmark, Norway, and Japan. These will include whaling factoryships; fish-processing refrigerator ships; and others.

According to the Chairman, the large Soviet ocean fishing fleet enables the Soviets to catch up to 4.2 million metric tons (about 9.3 billion pounds) of fishery products at the present time. (United States Embassy, Moscow, February 1, 1963.)

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NEW FACTORYSHIP COMPLETES SEA TRIALS:

The new Soviet 17,000-ton factoryship, Vladiwostock, recently completed sea trials in waters off Norway. The vessel, which was built in Kiel, West Germany, is powered by a five-cylinder engine of 6,250 British horsepower supplied by a firm in Copenhagen, Denmark. The new factoryship is equipped with a complete fish cannery. It also has engineering workshops which enable it to function as a repair ship for Soviet trawlers. Specifications of the Vladiwostock are: length 535 feet; maximum breadth 78 feet; depth 56 feet; and draft 29 feet. The vessel will have a crew of 400.

A sister ship, the Dal'nij Wostock is now under construction in Kiel, West Germany.

(Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 6, 1963.)



United Kingdom

COMPARATIVE TESTS MADE AT SEA WITH NEW TYPE AND CONVENTIONAL TRAWLS:

The new trawl developed under a British White Fish Authority project was tested in comparative trials with conventional trawls under normal fishing conditions in the Arctic Ocean by the Grimsby trawlers Royal Lincs and Coldstreamer. These vessels are sister ships, which was one of the conditions necessary to make the trials really comparative. The vessels sailed together from Grimsby on January 10, with 11 scientists on board. Heading the party was a scientist from the Scottish Department for Agriculture and Fisheries Marine Laboratory.

In order to minimize differences between the vessels and their crews in the results of the trials, the two trawlers were to fish in company and, as far as possible, for the same lengths of time. Both vessels carried conventional trawls and new trawls and were to fish the trawls interchangeably. The results of the hauls and all other data was to be carefully recorded.

This is the first time in the history of fishing that an effort has been made to create a fishing instrument on a scientific basis. The results of the trials could have great and lasting benefit to the whole of the British industry.

The two trawlers were to make a fishing voyage of normal length to the Barents Sea and then revert for several trips to ordinary fishing. Later they would carry out several more special testing trips. (Fish Trades Gazette, January 19, 1963.)

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MINIMUM LANDING SIZES FOR COD AND HADDOCK INCREASED:

A new Order, effective January 1, 1963, increases the minimum landing sizes permitted for cod and haddock caught in that part of the distant waters lying north of 66° N. latitude and east of the Greenwich meridian. For that area (which includes the Barents Sea and

United Kingdom (Contd.):

waters around the north Norwegian coast and Bear Island) the new minimum sizes are 34 centimeters (13.4 inches) for cod and 31 centimeters (12.2 inches) for haddock.

The new Order carries out a recommendation of the Permanent Commission of the International Fisheries Convention, 1946.

The sizes laid down for all other species in the Sea-Fishing Industry (Immature Sea-Fish) Order 1961 remain unchanged. The sizes laid down in that Order for cod and haddock continue to apply to fish of those species caught elsewhere than in the north-eastern waters.

The changes in minimum landing sizes have a bearing on the increase in the minimum size of mesh for nets in the same area, which also became effective on January 1.

* * * * *

PROPOSED EXTENSION OF FAROESE FISHING LIMITS THREATENS ABERDEEN FISHING INDUSTRY:

At the Scottish port of Aberdeen, trawler owners and trawl fishermen early in February of this year, were anxiously awaiting the outcome of talks in Copenhagen on the proposed extension of the fishing limit for British trawlers off the Faroes from 6 to 12 miles.

The Faroese Prime Minister and the Minister of Finance and Fisheries were in Copenhagen to discuss with the Danish Government the islanders' demand to increase the limit.

The Secretary of Aberdeen Fishing Vessel Owners' Association, Ltd., said: "If the limit is extended off the Faroes to 12 miles it could mean that Aberdeen is finished as a major fishing port. There is no doubt about that." He added that some Aberdeen trawlers are already losing more than £7,000 (US\$19,600) per year.

A forecast of the effect that the extension of the Faroese limits might have upon the Humber ports was also made by the Secretary of the Hull Trawler Officers' Guild.

He stated: "Many Faroese-owned ships land their catches at Grimsby, and I am

afraid that they will not be welcomed there if British vessels have to fish further from the Faroese coast.

"If Grimsby refuses to have Faroese-owned vessels, we do not want them in Hull. We want to make that quite clear.

"For most of the year the Hull market is oversupplied, and official returns last year showed that despite heavier landings in 1962, revenue was down by between £800,000 and £1,000,000 (US\$2,240,000-2,800,000).

"Why should we aggravate this depression and further undermine the economic stability of our market by allowing landings by foreigners to whom no quota import restrictions apply?

"As discharges in England by Icelanders are restricted to certain quantities in specific months of the year, they can never be regarded as a serious threat to the livelihood of our own fishermen.

"The Faroese, however, are under no landing restrictions and their fishing fleet is still growing.

"If the Faroese fishing limits are extended, Aberdeen will just about be written off as a fishing port.

"Virtually all of the vessels operating from there have been built for Faroese fishing and I don't know what they are going to do.

"An extension of the Icelandic limit was bad enough, but the Faroese threat will make the position even worse.

"So far as Grimsby is concerned, a large fleet from there fishes the Faroe grounds.

"We in Hull, specializing in larger vessels, concentrate on more distant-water fishing."

On February 8, 1963, the British Ministry of Agriculture and Fisheries called a meeting of representatives of various sections of the industry, including the British Trawlers' Federation and the Scottish Trawlers' Federation, to review the Faroese situation. (Fish Trades Gazette, February 9, 1963.)

Note: See Commercial Fisheries Review, July 1962 p. 61.

* * * * *

United Kingdom (Contd.):

TRAWLERS EXPERIMENT WITH ANTIBIOTIC ICE TO PRESERVE CATCH:

Two Grimsby trawlers in February 1963 were engaged in an investigation to determine whether the use of antibiotics in ice has value in the preservation of the catch.

Experiments and research into the use of antibiotics have been carried out by the Torry Research Station of the Department of Scientific and Industrial Research in recent years following the introduction of their use in Canada, where it was found that the application of a few parts per million definitely slowed down bacterial spoilage.

Large quantities of fish are treated every year in Canada where it has been found that two antibiotics (chlortetracycline and oxytetracycline) were particularly effective.

Up to last year, however, the use of antibiotics in Britain was of little more than scientific interest, for existing food regulations did not permit fish which had been treated with those substances to be sold for human consumption.

Last year the situation was changed by the passing of the Preservatives in Food Regulations which permit the use of tetracyclines on raw fish.

Before there was any real possibility of tetracyclines being employed by the British fishing industry, it had to be discovered whether or not their use under conditions of catching and distribution offered any definite advantage in improvement in the quality of the fish and whether it was an economic proposition.

In order to try and obtain the necessary information a full-scale trial, supervised by scientists from the Torry Research Station, is at present being carried out by the Grimsby trawlers Ross Renown and Northern Sea.

Each of the trawlers was supplied with 20 tons of ice treated with the two antibiotics, the ice being specially prepared by the Grimsby Ice Co. Ltd. One vessel carries one variety of antibiotic ice while the other has the second type. In addition, both ships carry their usual tonnage of normal untreated ice.

A member of the Torry Research Station is on board each trawler to obtain accurate

scientific data of the progress of the experiment. The two ships will fish, as far as is practicable, in the same vicinity at the deep-water fishing grounds.

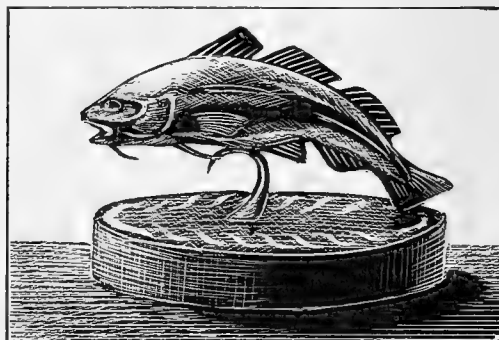
They will fish in the usual way except that the early part of the catches will be divided, half being stowed in ordinary ice and half in antibiotic ice.

When the trawlers land their catches at Grimsby, the fish will be laid out with the antibiotic ice and normal ice preserved fish side by side for comparison purposes. The fish will be displayed on the fish market so that all interests in the industry will be able to see the results and form their own judgment. (Fish Trades Gazette, February 9, 1963.)

* * * * *

TRAWLER SOMERSET MAUGHAM WINS SILVER COD TROPHY FOR 1962:

The 1962 winner of the Silver Cod Trophy in Great Britain was the Hull trawler Somerset Maugham. The vessel's skipper, who is only 30 years old, was presented the trophy at the British Trawler's Federation annual dinner on March 7, 1963.



The British silver cod trophy to be presented annually to the distant-water trawler with the largest total catch for the year.

The winner of the trophy joined the fishing fleet in March 1961. During 1962, the vessel was at sea 338 days and landed a total of 46,560 kits (6,518,400 pounds) valued at £146,182 (US\$409,130). The landings by the Somerset Maugham were the second highest since the competition began nine years ago. The record is held by the Kirkella, which landed 46,589 kits or 6,522,460 pounds in 1955. (Fish Trades Gazette, January 12, 1963.)

* * * * *

United Kingdom (Contd.):

VALUE OF IMPORTED FISHERY PRODUCTS AMONG WORLD'S HIGHEST:

Only the United States pays more money for fish and fish products than the United Kingdom, according to figures gathered by the Food and Agriculture Organization (FAO). In 1961, the British spent close to US\$175.4 million for 607,200 tons of fishery imports. The United States in 1961 spent about \$361.4 million for 715,100 tons, an all-time world high in both quantity and value.

West Germany in 1961 actually imported slightly more fishery products (655,800 tons) than the United Kingdom, but because of differences in the types of imports, spent only about \$113.8 million.

Although the cost of fishery products imports to the British in 1961 was second to that paid by the United States, it was still less than what they have been paying since 1958. In that year the British paid \$190.7 million for 484,500 tons. In 1959, they paid even more--\$202.2 million for 489,000 tons and in 1960, the cost was down to \$189.5 million for 554,100 tons.

At the same time the United Kingdom was importing more fish and at a higher cost, her fishery exports were dropping in volume, but the value stayed about the same over the 4-5 year period.

In 1961, the United Kingdom exported 49,800 tons valued at \$20.7 million. This was less than the 54,900, 61,700, and 58,800 tons she exported in the years 1958, 1959, and 1960 although her import earnings for all those years were approximately the same.

In 1948, the United Kingdom exported 96,800 tons of fishery products valued at \$23.5 million.



Venezuela

BASE FOR FOREIGN FISHING VESSELS:

In a speech made on January 22, 1963, at Barcelona, the Venezuelan Minister of Agriculture noted that the Japanese tuna fleet was now fishing in the Atlantic Ocean and that they had obtained port facilities in Brazil. He then stated that he thought it would be good if Venezuela were to offer similar facilities. His reasoning was that the Japanese would need supplies, fuel, possibly other merchandise, and that the fishermen would require recreation.

He also pointed out that there are fish canneries in Cumana which are not using their available canning facilities because the sardine catch is not sufficient to keep the canneries fully occupied.

This suggests that vessels from other nations might be able to use Venezuela as a base and sell part of the catch to the canneries in Cumana. While this would require intergovernmental agreements as well as private arrangements between the fishing vessels and the canneries, there is an indication that such an arrangement is possible. (United States Consul, Puerto La Cruz, January 23, 1963.)



FLOOD FORECASTS WILL BE IMPROVED BY NEW RAIN MEASURING DEVICE

Rainfall as far as 100 miles away can be measured by a new radar device. When it is ready for operational use, the device will improve river and flood forecast substantially. From a single, convenient location, it will provide instantaneous measurements of precipitation at many points over a broad area. The measurements will be used in modern computers to prepare river and flood forecasts.

To be tested by the U. S. Weather Bureau, the "Radar precipitation integrator" converts the intensity of radar echoes at 150 points over a river basin into quantitative terms. The information can then be sent to River Forecast Centers.

The device was developed and constructed by the Stanford Research Institute. Tests of the equipment will be conducted at the Weather Bureau's Radar Research Laboratory in Norman, Okla. (Science News Letter, February 2, 1963.)



FEDERAL ACTIONS



Department of the Interior

CONTRACT AWARDED FOR THE PROCESSING AND SALE OF ALASKA SEAL SKINS:

The Secretary of the Interior announced on March 5, 1962, the award of a contract for the processing and sale of United States Government-owned fur seal skins harvested on the Pribilof Islands, Alaska.

The contract, awarded to Supara of Chicago, Ill., will locate its plant in St. Louis, Mo. The contract entered into for the period ending December 31, 1974, replaces the former contract with Fouke Fur Company of Greenville, S. C., which was terminated on December 31, 1962.

Following an invitation and prospectus issued in June 1962 for processing and selling Government-owned Alaska seal skins, 10 firms requested raw seal skins for the purpose of demonstrating their capability for processing quality-finished furs. Four firms submitted sample skins as evidence of their technical competency for male and female skins, and a fifth firm submitted a proposal for female skins only.

The Department appointed an Industry Panel of five to examine and evaluate the skins processed by those firms submitting proposals. In addition the competing skins were subjected to a series of physical and chemical tests performed by the National Bureau of Standards.

The selection of Supara was based upon the quality of the processed samples as determined by the Industry Panel and the National Bureau of Standards tests, enabling the Government to provide for the uninterrupted handling of seal skins, and assuring the luxury fur industry of the continued availability of finished seal skins that meet the high standards of quality of materials and workmanship expected by the fur industry.

The contract which has been awarded is more favorable to the Government than the previous contract in several respects. For seal skins processed and sold as dressed, dyed, machined, and finished seal skins, Supara will receive \$14 per skin plus 16 percent of the average selling price, as compared with \$15 per skin plus 17½ percent of the selling price under the old contract; for female seal skins processed and sold as sheared, dressed and finished seal skins, the Government will pay \$18 per skin selling at \$30 plus 16 percent of the average selling price in excess of \$30, compared with \$18.75 and 17½ percent under the terminated contract; Supara is assured of an annual net profit, before taxes, of \$177,400 which is considered to be a fair and reasonable return on projected income and is subject to adjustment based upon an increase or decrease in income. Excess profits will be turned over to the Government; Supara receives no increase in annual profit regardless of volume of sales if expenses exceed 87.375 percent of Company's income, whereas the old contract contained no restriction on expenses or income; discount of 1 percent allowed buyers under old contract for cash will be discontinued, resulting in additional revenues of more than \$40,000 annually to the Government; Supara will assign and transfer to the Government full and entire right in and to inventions and discoveries (except dyes); and provision is made for the Govern-

ment to participate in sale of any byproducts; under the old contract the Government received no part of the contractor's income from sale of byproducts.

The new contract provides for the redetermination of price after the conclusion of the fourth auction and at five-year intervals thereafter or at any other time at the request of either party.

While the contract covers the period ending December 31, 1974, it may be terminated at any time when Supara fails, in the judgment of the Secretary of the Interior, to maintain the recognized standards of quality of materials and workmanship expected by the fur industry from past experience, except as the same may be a direct result of the condition of the raw skins as furnished by the Government.

The State of Alaska will be the principal beneficiary of the larger return the Government will receive from the processing and selling of seal skins since the State receives 70 percent of the net proceeds.

NEW SCIENCE ADVISOR TO SECRETARY APPOINTED:

Dr. John C. Calhoun, Jr., of College Station, Texas, has been appointed Science Adviser to the Secretary of the Interior, Secretary Stewart L. Udall, announced on February 25, 1963.



Dr. John C. Calhoun, Jr.

Dr. Calhoun, who is on a year's leave of absence from his duties as vice chancellor for development of the Texas A. and M. College System, will serve as the principal science adviser to the Secretary and will coordinate scientific programs of the Department of the Interior. His appointment will be effective May 1, 1963. He replaces Dr. Roger Revelle of the Scripps Institution of Oceanography, who is returning to private research.

Born in Betul, Pa., on March 21, 1917, Dr. Calhoun received his B. S., M. S., and Ph. D. degrees in petroleum and natural gas engineering from Pennsylvania State University, completing the latter in 1946.

He joined the Texas A. and M. College System in 1955 and served as director of the Texas Engineering Station, director of the Texas Engineering Extension Service, and dean of engineering of the A. and M. College of Texas in addition to his present position.

Prior to 1955, he was associated with the Pennsylvania State University and the University of Oklahoma, serving also as a consultant for several private organizations and research laboratories. He is also the author of many scientific papers on petroleum and natural gas engineering.

Note: See Commercial Fisheries Review, September 1961 p. 111.



INTERSTATE COMMERCE COMMISSION

[49 CFR Parts 123, 206, 301]

[Docket No. 34206]

COMMODITY CLASSIFICATION FOR REPORTING PURPOSES

Notice of Proposed Rule Making

JANUARY 9, 1963.

Notice is hereby given pursuant to section 4 of the Administrative Procedure Act, 5 U.S.C. 1003, that the Commission proposes to amend 49 CFR 123.1 to 123.5, 123.21 to 123.27, both inclusive, 49 CFR 206, and 49 CFR 301.10 and 301.20, as may be necessary, to provide that Class I and II railroads, other than switching or terminal companies, Class A and B carriers by water, maritime carriers, and Class I common and contract motor carriers of property operating in intercity service, to the extent that any such carriers now are required to report commodity statistics either on an annual or a quarterly basis, be required, effective with reports for the calendar year 1964 or the first quarter thereof, as the case might be, to report commodity statistics on the basis of the commodity classification set forth in Appendix A below, which is hereby referred to and made a part of this notice, in lieu of the commodity classifications set forth in Appendix I to 49 CFR 123.1 to 123.5, in Appendix I to 49 CFR 123.21 to 123.27, and in 49 CFR 206.8.

(49 CFR 123.1 to 123.5, sec. 12, 24 Stat. 383, as amended; 49 U.S.C. 12. Interpret or apply sec. 20, 24 Stat. 386, as amended; 49 U.S.C. 20)

(49 CFR 123.21 to 123.27, authorities set out above, also interpret or apply sec. 313, 54 Stat. 944, as amended; 49 U.S.C. 913)

(49 CFR 301.10 and 301.20, sec. 304, 54 Stat. 933, 49 U.S.C. 904. Interpret or apply sec. 313, 54 Stat. 944, as amended; 49 U.S.C. 913)

The proposed changes will affect the presently required reporting of commodity statistics by the respective types of carriers named above. The carriers will be required to report such statistics on the basis of the "Proposed ICC Standard Commodity Code" reproduced in Appendix A, rather than on the basis

of the presently required commodity classification. No other changes are contemplated in other provisions affecting the reporting of commodity statistics under the terms of the respective sections, in the number of copies of the required reports to be filed, the place of filing, or the times following the close of the covered periods in which the respective reports must be filed.

The "Proposed ICC Standard Commodity Code" has been designed so that statistics reported thereunder for use of the Commission may be related to existing and projected commodity data compiled and published by the Federal government. It is an adaptation of the "Commodity Classification for Transportation Statistics" developed by the Office of Statistical Standards, Bureau of the Budget, for use in the planned Census of Transportation for 1963, which in turn was based on the Standard Industrial Classification (S.I.C.) prepared by the Bureau of the Budget and used generally by government agencies and others in the collection and presentation of data relating to business establishments. The "Proposed ICC Standard Commodity Code" is compatible with the "Proposed Standard Transportation Commodity Code" developed also on the basis of the Bureau of the Budget "Commodity Classification for Transportation Statistics" by the Association of American Railroads and proposed for use within the railroad industry effective January 1, 1964.

Any party desiring to make representations in regard to the proposed change may do so through submission of written data, views or arguments. The original and 6 copies of such representations must be filed with the Interstate Commerce Commission, Washington 25, D.C., within 60 days of the publication hereof in the FEDERAL REGISTER.

A copy of this notice shall be mailed to each railroad, motor carrier, and water carrier subject to the commodity statistics reporting requirements of the respective CFR sections named herein, and notice shall be given to the general public by depositing a copy in the office of the Secretary of the Commission at Washington, D.C., and by filing a copy

Interstate Commerce Commission

STANDARD COMMODITY (INCLUDING FISHERY PRODUCTS) CODE FOR REPORTING PURPOSES PROPOSED:

The Interstate Commerce Commission in a Notice of Proposed Rule Making published in the Federal Register of February 2, 1963, listed the proposed commodity classifications for reporting purposes applicable to most common carriers. The notice as it appeared in the Federal Register, February 2, 1963, and the parts of Appendix A of some interest to the fishing industry follow:

with the Director, Office of the Federal Register.

By the Commission, Division 2.

[SEAL] HAROLD D. MCCOY,
Secretary.

APPENDIX A

PROPOSED ICC STANDARD COMMODITY CODE FOR REPORTING PURPOSES

Code	Description
09	FRESH FISH AND OTHER MARINE PRODUCTS
091	Fresh Fish and Other Marine Products:
0912	Fresh fish and whale products, including frozen unpackaged fish—
09120	Fresh fish and whale products, including frozen unpackaged fish: Finfish; shellfish; whale products.
0913	Marine products—
09130	Marine animal skins, except whale skins, untanned; miscellaneous marine products.
09131	Shells (oyster, crab, clam, etc.).
2031	Canned and cured sea foods—
20310	Canned and cured sea foods: Canned fish and other sea food; canned sea food soup, stews and chowders; smoked, salted, pickled and dried fish; fish roe and livers.
2036	Fresh or frozen packaged fish—
20360	Fresh or frozen packaged fish: Frozen packaged fish and other sea food; fresh packaged fish and other sea food.
2095	Marine fats and oils—
20950	Marine fats and oils: Marine oil mill products; marine oil mill byproducts (meal, scrap, tankage).
373	Ships and Boats:
3732	Ships and boats—
37320	Ships and boats: Inboard motor boats; outboard motor boats; nonpropelled ships (barges, dredges); car floats, pontoon and portable bridges; ships and boats and parts, n.e.c.
3949	Sporting and athletic goods—
39490	Sporting and athletic goods: Fishing tackle and equipment; billiard and pool tables, and playing supplies, including balls; bowling alleys and bowl-

ing alley playing supplies, including balls; golf clubs, golf balls and equipment and supplies; tennis, baseball, cricket, softball, football, basketball, soccer equipment and supplies, including balls; playground equipment; sporting and athletic goods, n.e.c.

42111 Shipping containers, bags, barrels bottles, boxes, cones, drums, tubes, etc., returned, empty.

42112 Shipping carriers or devices, blocking, bolsters, cradles, pallets, racks, etc., returned, empty.



U. S. Tariff Commission

CHANGES IN IMPORT TARIFF SCHEDULES FOR SOME FISHERY PRODUCTS AND GEAR PROPOSED:

A proposal for a Fifth Supplemental Report of changes in the Tariff Schedules of the United States necessary to reflect changes made in the tariff treatment of imported articles as set forth by various statutes and administrative and judicial rulings has been made public. The notice by the U. S. Tariff Commission was published in the Federal Register of February 27, 1963.

Items listed of interest to the fishing industry are anchovy oil and fishing nets (including sections thereof). Provisions of Annex I state that further consideration is being given to determine whether to establish anchovy oil (item 177.12), and carrageen and carrageenin (items 192.05-192.07). Notice was given that the following additional items will be considered as included in Annex I to the Commission's public notice issued February 21, 1963:

"11a Item 355.45--Fish netting and fishing nets (including sections thereof). Further consideration is being given to determine whether a rate adjustment is necessary."

A public hearing was held on March 14, 1963, in the Tariff Commission Building, Washington, D.C.



Treasury Department

BUREAU OF CUSTOMS

GROUND FISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1963:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean

perch) fillets and steaks for calendar year 1963 is 24,874,871 pounds, the Bureau of Customs announced in the February 21, 1963, Federal Register. Divided into quarterly quotas this means that 6,218,718 pounds of groundfish fillets and steaks during each quarter of 1963 may be imported at the 1-7/8 cents-per-pound rate of duty and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound.

The reduced-rate import quota for 1963 is 12.9 percent less than the 1962 quota of 28,571,433 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound had increased 24.7 percent, but in 1961 the trend was reversed significantly for the first time because in 1960 frozen fish fillet blocks with bits and pieces were no longer dutiable under the Tariff category of "frozen groundfish fillets." A further decline took place in 1963. The 1963 quota (the lowest since 1950) is 15.1 percent less than in 1951.

Reduced-Tariff-Rate Import Quota for Fresh and Frozen Groundfish Fillets, 1953-1963	
Year	Quota 1,000 Lbs.
1963	24,875
1962	28,571
1961	32,601
1960	36,533
1959	36,920
1958	35,892
1957	37,376
1956	35,197
1955	35,433
1954	33,950
1953	33,866

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1960-62) preceding 1963 was only 165,832,470 pounds, calculated in accordance with the proviso to item 717(b) of Part 1, Schedule XX, of the General Agreement on Tariff and Trade (T. D. 51802). This was far below the consumption of 217,337,633 pounds in 1958-60 and 243,554,480 pounds for 1957-59.

A decision by the United States Customs Court in 1959 held that fish blocks imported in bulk are dutiable at one cent a pound under Tariff paragraph 720(b). Prior to that decision, fish blocks were classified under paragraph 717(b), the same as fish fillets. The change became effective September 15, 1959, and fish blocks imported in bulk since that date have been classified under paragraph 720(b). Therefore, fish blocks imported since the effective date have not entered in the calculation of apparent annual consumption or the quota since only imports under 717(b) are considered in the calculation. In view of this, it is estimated that if fish blocks had remained under the 717(b) classification, apparent annual consumption for 1960-62 would have been greater than that for the previous three-year period, and also the quota for 1963 would have been greater than that for 1961 and 1962.

FOREIGN ASSETS CONTROL

CERTIFICATES FOR IMPORTATION OF DRIED CUTTLEFISH FROM TAIWAN AVAILABLE:

A notice was published in the Federal Register of February 15, 1963, concerning the importation of certain merchandise directly

from Taiwan which included dried cuttlefish. The notice as it appeared in the February 15, 1963, Register follows:

IMPORTATION OF CERTAIN MERCHANDISE DIRECTLY FROM TAIWAN

Available Certifications by Government of Republic of China

Notice is hereby given that certificates of origin issued by the Ministry of Economic Affairs of the Republic of China under procedures agreed upon between that Government and the Foreign Assets Control are now available with respect to the importation into the United States directly, or on a through bill of lading, from Taiwan (Formosa) of the following additional commodities:

Coramint oil.
Cuttlefish, dried (Mow Yu).

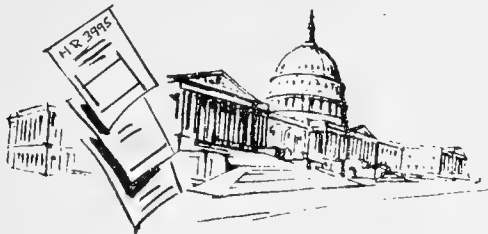
ISEAL] MARGARET W. SCHWARTZ,
Director,
Foreign Assets Control.



Eighty-Eighth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduc-



tion, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANADROMOUS FISH CONSERVATION: H. R. 3995 (Shelley) introduced in House Feb. 21, 1963, to authorize the Secretary of the Interior to initiate a program for the conservation, development and enhancement of the Nation's anadromous fish in cooperation with the several States; also H. R. 4225 (Cohelan) introduced Feb. 26, 1963, both referred to Committee on Merchant Marine and Fisheries.

CHEMICAL PESTICIDES COORDINATION: H. R. 4487 (Dingell) introduced in House Mar. 4, 1963, to amend the act of August 1, 1958, in order to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides; re-

ferred to the Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES FUND: On Feb. 25, 1963, the House and Senate were presented with a resolution of the Senate of the State of Alaska (Senate Resolution 15) urging the Congress of the United States to give favorable consideration to S. 627 (Bartlett of Alaska), a bill to promote State commercial fishery research and development projects. The resolution further states that several states of the Union have taken the initiative in fishery research and development; the offshore fishery resources of the United States are the proper concern of both the Federal and State Governments; the Federal Government has an obligation to encourage and assist in State research and development programs; and a bold program to assist the States in their efforts to develop their fishing resources is essential to the proper conservation and utilization of this basic resource. The resolution was referred to the Senate Committee on Commerce and the House Committee on Merchant Marine and Fisheries.

H. R. 5229 (O'Hara) introduced in House Mar. 28, 1963, to promote State commercial fishery research and development projects, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

COMMODITY PACKAGING AND LABELING: The Antitrust and Monopoly Subcommittee of the Senate Committee on the Judiciary on Mar. 6, 1963, began a series of hearings on S. 387, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packing or labeling certain consumer commodities distributed in commerce, and for other purposes. Directs the Food and Drug Administration--for foods, drugs, and cosmetics--and the Federal Trade Commission--for other consumer commodities--to promulgate regulations that will require packages accurately and clearly to give essential product information and fairly represent the contents. The Committee on Mar. 25, 1963, recessed its hearings, subject to call.

DELAWARE RIVER BASIN: H. Doc. 522, Volumes VIII, X, and XI, Delaware River Basin, New York, New Jersey, Pennsylvania, and Delaware (A letter from the Chief of Engineers, Department of the Army, dated April 2, 1962; submitting a report, together with accompanying papers and illustrations, on a review of the Delaware River and tributaries, requested by a resolution of the Committee on Public Works, U. S. Senate, adopted April 13, 1950, and other resolutions of that Committee and of the Committee on Public Works, House of Representatives, listed in the Report, House of Representatives, 87th Congress, 2nd Session), 554 pp., 266 pp., and 172 pp., respectively, illus., printed, Volume VIII contains Appendix O, intrastate water resources survey; included are sections on water pollution, fish and game management, and the University of Delaware marine laboratories. Volume X contains Appendix T, hydroelectric power, and Appendix U, project designs and cost estimates. Volume XI contains Appendix V, benefits and cost allocations; Appendix W, recreation needs and appraisals; and Appendix X, study of the governmental organization for the water resources of the Delaware River Basin.

Correction: In the March 1963 issue under the heading: Delaware River Basin, Volumes V and IX, listed as 88th Congress, 1st Session, should have read 87th Congress, 2nd Session.

EMERGENCY FOOD STOCKPILING: H. R. 362 (Hull) introduced in House Jan. 9, 1963, to provide for the stockpiling, storage, and distribution of essential foodstuffs and other essential items for the sustenance of the civilian population of the United States, its territories, possessions, and the District of Columbia, in the event of enemy attack or other disaster; referred to the Committee on Armed Forces. Under the terms of the bill the food for the stockpile would be obtained where possible from the Commodity Credit Corporation, but other foodstuffs necessary but not available from that source would be purchased on a competitive basis. Presumably, processed fishery products would fall within this latter category.

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: H. R. 4700 (Harris) introduced in House Mar. 11, 1963, and S. 1061 (Magnuson) introduced in the Senate Mar. 14, 1963, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes; referred to the House Committee on Interstate and Foreign Commerce and the Senate Committee on Commerce. Exempts carriers from minimum rate regulation by the Civil Aeronautics Board, the Federal Maritime Commission, and the Interstate Commerce Commission in the transportation of bulk commodities and certain agricultural and fishery products. Such exemption applies to (1) bulk commodities, (2) agricultural and fishery products, and (3) passengers. The exemption from minimum rate regulation for the transportation of certain agricultural and fishery products (specified in sec. 203(b) of the Interstate Commerce Act) now available to only motor carriers and freight forwarders would be extended under this section to all carriers subject to the Interstate Commerce Act. Defines "Property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof) shall not be deemed to include frozen fruits, frozen berries, frozen vegetables, wool tops, and noils, or wool waste (carded spun, woven, or knitted), and shall be deemed to specifically include cooked or uncooked (including breaded) fish or shellfish when frozen or fresh (but not including fish and shellfish which have been treated for preserving such as canned, smoked, pickled, spiced, corned, or kippered product)."

FISH AND WILDLIFE AID THROUGH EQUIPMENT TRANSFER: H. R. 4705 (McDowell) was introduced Mar. 11, 1963, to amend the provisions of law relating to the disposition of surplus real property for park and recreational area, historic monument, and fish and wildlife conservation purposes; referred to the Committee on Government Operations.

A similar bill H. R. 5161 (Barry) introduced in House Mar. 28, 1963, to provide that surplus personal property of the United States may be donated to the States for the promotion of fish and wildlife management activities, and for other purposes; referred to the Committee on Government Operations.

FISH FARMERS PROGRAM: On Mar. 8, 1963, Senator Fulbright of Arkansas, presented to the Senate a resolution passed by the 65th General Assembly of the State of Arkansas (Senate Concurrent Resolution 5), urging the acceleration of programs designed to assist fish farmers. In his remarks Senator Fulbright stated he was hopeful that the work of both the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries

and Wildlife on fish farming problems can be expedited in next fiscal year.

FISHERIES AND OCEANOGRAPHY DEPARTMENT: On Mar. 4, 1963, the Senate and the House were presented with a resolution of the Senate of the State of the State of Alaska (Senate Joint Resolution 9) urging the President of the United States to establish a Department of Fisheries and Oceanography. The resolution further states that the fisheries of the United States occupy an ever-increasing importance to the general well-being of the Nation; the power of States to adequately protect and enhance the value of fisheries is clearly limited by the nature of our constitutional system; foreign nationals have created competitive pressures which may only be met on a national scale; the past lack of interest of Federal authorities in fisheries problems has resulted in a drop of American fisheries production from second to fifth in the world market, and a complete lack of aid and protection for American fishermen; fisheries provide a source of livelihood for hundreds of thousands of American citizens deserving of constant Federal attention to the maintenance and improvement of the industry; a cabinet level Department of Fisheries and Oceanography containing a research and management section and an international section is necessary to deal with the scope and magnitude of the problems involved; and that Governor William A. Egan of Alaska has already requested the President of the United States to make every effort toward establishing such a cabinet position. Referred to the Senate Committee on Commerce and the House Committee on Government Operations.

FISHERY MARKETING ACT AMENDMENT: S. 1135 (Magnuson and Bartlett) introduced in Senate Mar. 19, 1963, to make clear that fishermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends; referred to the Committee on Commerce. Would amend the Fisheries Marketing Act of 1934, an act originally designed to provide fishermen as primary producers with the right of self-association for cooperative improvement of their conditions. The amendment seeks to bring the Marketing Act up to date by relating it to the practical problems that presently cloud the rights of fishermen to associate themselves together, whether in unions or cooperatives, and collectively bargain for a fair return on the fish harvested.

Collective Bargaining for Fishermen (Hearings before the Subcommittee on Merchant Marine and Fisheries of the Committee on Commerce, U. S. Senate, 87th Congress, 2nd Session), 254 pp., printed. Contains hearings held Oct. 15, 16, 17, 18, 19, and Nov. 8, 1962, on S. 3093, to make clear that fishermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends. The hearings were held in the following locations: Seattle, Washington; Ketchikan, Petersburg, Anchorage, Dillingham, and Kodiak, Alaska.

FISH HATCHERY (EASTERN KENTUCKY): H. R. 4324 (Natcher) introduced in House Feb. 27, 1963, to provide for the establishment of a new fish hatchery on or near the Cumberland River in the eastern part of the State of Kentucky; referred to the Committee on Merchant Marine and Fisheries.

FISH HATCHERY (KENTUCKY): H. R. 4190 (Perkins) introduced in House Feb. 25, 1963, to provide for the

establishment of a fish hatchery in the State of Kentucky; referred to the Committee on Merchant Marine and Fisheries. Also H. R. 4478 introduced in House Mar. 4, 1963.

FOOD-FOR-PEACE, AND FISH: The Senate of the State of Alaska on Feb. 25, 1963, presented a resolution (Senate Resolution 16) to the Senate and the House, requesting that favorable consideration be given to S. 702 (Bartlett et al), a bill which would make a domestically-produced fishery product available for distribution under the food-for-peace program to assist that program and the development of the domestic fishery. The resolution states further that the Federal Government has embarked on a program of Food for Peace to facilitate the purchase of domestic food surpluses for sale to needy foreign nations; the use of high-protein value fishery products would contribute to the value of the program; the development of the offshore fishery resources of the United States can be protected only if expanding domestic and foreign markets are provided and developed; and the untapped offshore fishery resources of the United States are being harvested by foreign powers unconcerned with proper conservation measures. The resolution was referred to the Senate Committee on Commerce and the House Committee on Merchant Marine and Fisheries.

HIGHWAYS AND FISH AND WILDLIFE PROTECTION: H. R. 4488 (Dingell) introduced in House Mar. 4, 1963, to amend the Fish and Wildlife Coordination Act to require approval by the Secretary of the Interior of highway projects before they can be constructed; referred to the Committee on Merchant Marine and Fisheries.

IMPORTED COMMODITY LABELING: The House on Feb. 26, 1963, considered and passed H. R. 2513, to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes. Bill would make three substantial changes in existing law; (1) it would be required that articles removed from a container be marked to show country of origin; (2) containers for articles for export to the United States must be marked to indicate that in the event of repackaging, such repackaging must contain the designation of the country of origin; (3) there is a penalty provision for failure to comply with these marking requirements applicable in the case of repackaging. The Senate on Feb. 28, 1963, received the bill and referred it to the Committee on Finance.

The Senate Committee on Finance, on Mar. 21, 1963, held hearings on H. R. 2513.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1964: The Senate Committee on Appropriations on Feb. 26, 1963, began hearings on the fiscal 1964 budget estimates for the Department of the Interior. Included are funds for the Fish and Wildlife Service, its two bureaus--Commercial Fisheries and Sport Fisheries and Wildlife--and the Office of the Commissioner. Testimony on behalf of the Bureau of Commercial Fisheries was given by the Commissioner, Fish and Wildlife Service, and the Director of the Bureau on Mar. 6, 1963.

H. R. 5279 (Kirwan) introduced in House Mar. 28, 1963. The bill was reported favorably (H. Rept. 177) to the House by the Committee on Appropriations on the same date. The Committee recommended a total of \$65,933,400 for Fish and Wildlife Service funds for

FY 1964, against the budget estimate of \$74,666,000 and \$62,746,300 for 1963 appropriations. The Bureau of Commercial Fisheries portion for FY 1964 is \$20,665,000, against \$26,526,000 for the budget estimate and \$27,098,000 for 1963 appropriations; the Bureau of Sport Fisheries and Wildlife portion for FY 1964 is \$44,882,400 as compared with \$47,754,000 for the budget estimate and \$35,284,300 for fiscal year 1963; the Office of the Commissioner amount for FY 1964 is \$386,000, the same amount as the budget estimate, the appropriations for 1963 amounted to \$375,000.

H. R. 177, Department of the Interior and Related Agencies Appropriation Bill, 1964 (Mar. 28, 1963, a report from the House Committee on Appropriations, to accompany H. R. 5279), 46 pp., printed. Included are funds for the Fish and Wildlife Service, its two bureaus--Commercial Fisheries and Sport Fisheries and Wildlife, and the Office of the Commissioner.

For the Bureau of Commercial Fisheries under management and investigations of resources, the Committee recommended an allowance of \$17,175,000, an increase of \$1,678,000 in the 1963 appropriation and a decrease of \$1,853,000 in the 1964 budget estimate. The increases allowed under marketing and technology include: \$70,500 for Caribbean and Tropical Atlantic fisheries explorations; \$22,000 for Foreign Fisheries and Trade Unit; \$36,000 for maintenance of exploratory fish and gear research vessels; and \$446,600 for development of fish protein concentrate. The increase recommended under research includes \$447,700 for participation in the International Tropical Atlantic Fishery-Oceanographic Program; \$414,000 for operation of the research vessel Townsend Cromwell and initiation of Central Pacific oceanographic and biological research programs; \$61,000 for increased costs of operating the National Oceanographic Data Center; and \$52,200 for continued participation in the International Indian Ocean expedition.

In the special foreign currency program the Committee recommended the budget estimate of \$300,000, the same as the 1963 appropriation.

Under construction the Committee recommended \$1,800,000, a decrease of \$6,673,000 in the 1963 appropriation and a reduction of \$3,953,000 in the 1964 budget estimate. The disallowance includes \$1,095,000 of the \$1,165,000 for planning and construction of a shellfisheries research center at Milford, Conn., \$70,000 was allowed to provide for the planning, which the Committee believes should be completed before construction funds are considered. Also disallowed is \$2,650,000 requested for construction of a fishery research vessel for use in the North Pacific and Bering Sea pending completion of the design for which funds are currently available. The Committee reduction also includes \$8,000 of the request for advance planning for construction of laboratories and vessels and \$200,000 of the \$500,000 proposed to continue operational studies under the Columbia River Fishery facilities program.

The Committee has allowed the budget estimate of \$750,000, the same as the 1963 appropriation, for payment of subsidies for the construction of fishing vessels in U.S. shipyards under the provisions of the Act of June 12, 1960.

The Committee has allowed \$640,000, an increase of \$17,000 in the 1963 appropriation, and a decrease of \$55,000 in the 1964 budget estimate for general administrative expenses.

The Committee has allowed \$2,468,000 for administration of the Pribilof Islands, an increase of \$450,000 in the amount available for the current fiscal year, and a decrease of \$85,000 in the budget request.

For the Bureau of Sport Fisheries and Wildlife, the Committee recommended an appropriation of \$29,879,400, an increase of \$2,117,400 in the 1963 appropriation, and a decrease of \$1,604,600 in the 1964 budget estimate. Increases over the 1963 appropriations includes \$367,000 for operation of new hatcheries and other facilities; \$50,000 for planning of the National Fisheries Center and Aquarium; \$100,000 for expansion of pesticide-wildlife studies; \$140,000 for waterfowl management investigations; \$187,000 for investigations of wildlife control methods; and \$75,000 for site selection and engineering design of a marine game fish research station at Narragansett Bay, Rhode Island.

The Committee recommended for the Office of the Commissioner, the budget estimate of \$386,000, an increase of \$11,000 in the 1963 appropriations.

NATIONAL FISHERIES CENTER AND AQUARIUM: The Senate on Mar. 8, 1963, appointed Senators Magnuson and Prouty to the National Fisheries Center Advisory Board, for 4 years and 2 years respectively.

MEDICAL CARE FOR VESSEL OWNERS: On Mar. 25, 1963, the House and the Senate were presented with a resolution of the Senate of the State of Alaska (Senate Resolution 31), urging Congress to give favorable consideration to S. 978, to restore medical care benefits to owner-operators of fishing vessels and self-employed seamen under Federal law as an equitable action and a forward step toward the revival of the Nation's maritime industry.

OCEANOGRAPHIC RESEARCH PROGRAM: H. R. 4428 (Burke) introduced in House Mar. 4, 1963, to provide for a comprehensive, long-range, and coordinated program in oceanography, and for other purposes; referred to Committee on Merchant Marine and Fisheries.

OUTDOOR RECREATION BUREAU: The Senate on Feb. 28, 1963, received the report (S. Rept. 11) on S. 20, to promote the coordination and development of the effective Federal and State programs relating to outdoor recreation, and for other purposes. Authorities and responsibilities given the Secretary of the Interior through the bill would include maintenance of an inventory of outdoor recreation facilities, establishment of a classification system, provision for technical assistance, encouragement of regional cooperation by the States and developing facilities, conducting research, cooperating with educational institutions in developing personnel and disseminating recreation knowledge, and promoting coordination of Federal activities in outdoor recreation.

Outdoor Recreation Act of 1963 (Hearing before the Committee on Interior and Insular Affairs, U. S. Senate, 88th Congress, 1st Session on S. 20); 51 pp., printed. Contains hearing held Feb. 5, 1963; departmental reports; statements given by various Government agencies and interested organizations; and communications sent to the Committee.

S. Rept. 11, Federal and State Programs Relating to Outdoor Recreation (a report from the Committee on Interior and Insular Affairs, U. S. Senate, 88th Congress, 1st Session to accompany S. 20), 6 pp., printed.

The Committee reported favorably, with amendments, and recommended passage of the bill. Contains the purpose of the bill, the amendments, and letter of transmittal of the bill to Congress.

The Senate on Mar. 11, 1963, passed with amendments, S. 20, to promote the coordination and development of the effective Federal and State programs relating to outdoor recreation, and for other purposes. The House on Mar. 12, 1963, received from the Senate, S. 20; referred to Committee on Interior and Insular Affairs.

The House on Mar. 28, 1963, received the report (H. Rept. 160) from the Committee on Interior and Insular Affairs on H. R. 1762, to promote the coordination and development of effective Federal and State programs relating to outdoor recreation, and for other purposes, with amendment; referred to the Committee of the Whole House on the State of the Union.

PACIFIC ISLANDS TRUST TERRITORY DEVELOPMENT: H. R. 3198 (O'Brien) introduced in House Jan. 31, 1963, to promote the economic and social development of the Trust Territory of the Pacific Islands, and for other purposes; referred to Committee on Interior and Insular Affairs. Among the provisions of the bill is an amendment to existing law which would place the Trust Territory in the same category as insular possessions of the United States so far as importation free of duty into the United States is concerned. There is, however, an exception which would prevent the importation into the United States of fishery products free of duty unless the fish from which the fishery products are made are landed in the Trust Territory from American flag vessels or Trust Territory vessels manned by crew two-thirds of which are citizens of the United States or the Trust Territory. The Trust Territory includes the Mariana Islands, Marshall Islands, and the Caroline Island. Also provides for scientific, technical, and other assistance that will promote the welfare of the Trust Territory. Under this provision, the Secretary of the Interior would be limited to the sum of \$150,000 in any one fiscal year.

POLLUTION OF SEA BY OIL TREATY AMENDMENTS: The Senate on Mar. 25, 1963, received from the President, Executive C, 88th Congress, 1st Session, amendments of International Convention for the Prevention of Pollution of the Sea by Oil, 1954, which were adopted by a Conference of Contracting Governments convened at London on April 11, 1962; referred to the Committee on Foreign Relations. The amendments would strengthen and expand the present Convention in ways deemed advantageous to United States interests.

PRICE-QUALITY STABILIZATION: The following bills were introduced in the House: H. R. 3929 (Dent), H. R. 3943 (Friedel), H. R. 3983 (Rodebush), and H. R. 3998 (Stinson) Feb. 21, 1963; H. R. 4184 (O'Konski) Feb. 25, 1963; H. R. 4221 (Bray) Feb. 26, 1963; H. R. 4312 (Glenn) Feb. 27, 1963; H. R. 4477 (Stubbsfield) Mar. 4, 1963; H. R. 4541 (Nygaard) Mar. 6, 1963; H. R. 4626 (Clark) Mar. 7, 1963; H. R. 4703 (Jarman) Mar. 11, 1963; H. R. 4930 (Baltin) Mar. 18, 1963; and H. R. 5032 (Harris) Mar. 21, 1963; to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of names, or trademarks, and for other purposes; all referred to the Committee on Interstate and Foreign Commerce.

The Subcommittee on Commerce and Finance of the House Committee on Interstate and Foreign Commerce, on Mar. 18, 1963, announced that public hearings will be held Apr. 23, 24, and 25, 1963, on H. R. 3669, and similar bills, regarding price-quality stabilization.

SALMON RIVER ANADROMOUS FISH: S. 1043 (Church et al) introduced in Senate Mar. 7, 1963, to provide for the conservation of anadromous fish spawning areas in the Salmon River, Idaho; referred to the Committee on Commerce. Would prohibit the Federal Power Commission from authorizing any structures on the Salmon River which would restrict the passage of anadromous fish to reach spawning areas or which would flood established spawning grounds.

SALTONSTALL-KENNEDY FUNDS REAPPORTIONMENT: H. R. 4204 (Tupper) introduced in House Feb. 25, 1963, to amend the Saltonstall-Kennedy Act so as to establish an additional fund for fishery research programs and fisheries rehabilitation and development projects, and for other purposes; referred to Committee on Merchant Marine and Fisheries. Also H. R. 4448 (Knox) introduced in House Mar. 4, 1963.

SCIENCE AND TECHNOLOGY COMMISSION: H. R. 4346 (Teague) introduced in House Feb. 27, 1963, for the establishment of a Commission on Science and Technology; referred to the Committee on Science and Astronautics. Commission would be composed of representatives from the legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. Provides for a study of all of the programs, methods and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs, with objective of bringing about more economy and efficiency in the performance of these essential activities and functions. Also introduced in House H. R. 4846 (Wydlar) Mar. 13, 1963; referred to Committee on Science and Astronautics.

The Senate on Mar. 4, 1963, received the report (S. Rept. 16) without amendment on S. 816, for the establishment of a Commission on Science and Technology, from the Committee on Government Operations.

S. Rept. 16, Establishment of a Commission on Science and Technology (Report of the Committee on Government Operations, U. S. Senate, 88th Congress, 1st Session on S. 816), 66 pp., printed. The Committee reported favorably on the bill and recommended passage. Contains analysis of the provisions of S. 816; comments on the role of science in Government, background--committee reports and staff studies; a summary of the hearings held during the 85th, 86th, and 87th sessions of Congress; and appendix.

The Senate on Mar. 8, 1963, considered and passed without amendment S. 816. The House on Mar. 11, 1963, received from the Senate S. 816, for the establishment of a Commission on Science and Technology; referred to the House Committee on Science and Astronautics.

SUBMERGED LANDS ACT: S. 1109 (Long et al) introduced in Senate Mar. 15, 1963, to amend the Sub-

merged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending three marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources within said boundaries; referred to the Committee on Interior and Insular Affairs. Similar to many House bills previously introduced.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: The Subcommittee on Mines and Mining of the House Committee on Interior and Insular Affairs on Mar. 12, 1963, held hearings on H. R. 2888, to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory at College Park, Maryland. Testimony was given by departmental witnesses and Rep. Lankford (Md.).

TRANSPORTATION ACT OF 1963: H. R. 4701 (Harris) introduced in House Mar. 11, 1963; and S. 1062 (Magnuson) introduced in Senate Mar. 14, 1963, to provide for strengthening and improving the national transportation system, and for other purposes; referred to the House Committee on Interstate and Foreign Commerce and the Senate Committee on Commerce. Bill would: (a) authorize and encourage common carriers to conduct experiments in rate simplification, freight classification, and new services; (b) extend to all shippers and carriers the right to ship vehicles and containers by any mode at non-discriminatory rates; (c) encourage the establishment of through service and joint rates by all combinations of modes and assure the reasonableness of such rates; (d) provide for cooperative enforcement of highway transportation regulation by the ICC and the States; (e) increase and extend the civil forfeiture penalties to violations of safety regulations and operations without authority; (f) require air carriers to pay reparations to shippers charged unlawfully high rates; (g) authorize simplification of Government transportation rates and procurement and greater flexibility in the use of motor vehicle common carriers for the transportation of mail; and (h) transfer the existing railroad loan guarantee program from the ICC to the Department of Commerce.

VESSEL CONSTRUCTION SUBSIDY AMENDMENT: H. R. 4203 (Tupper) introduced in House Feb. 25, 1963, to amend the act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. S. 1006 (Magnuson et al) introduced in the Senate Mar. 4, 1963; referred to the Committee on Commerce and H. R. 4429 (Fulton) introduced in House Mar. 4, 1963; referred to the Committee on Merchant Marine and Fisheries.

WATER RESOURCES COUNCIL: S. 1111 (Anderson et al) introduced in Senate Mar. 15, 1963, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a Water Resources Council and river basin commissions, and by providing financial assistance to the States in order to increase State participation in such planning; referred to the Committee on Interior and Insular Affairs.





CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

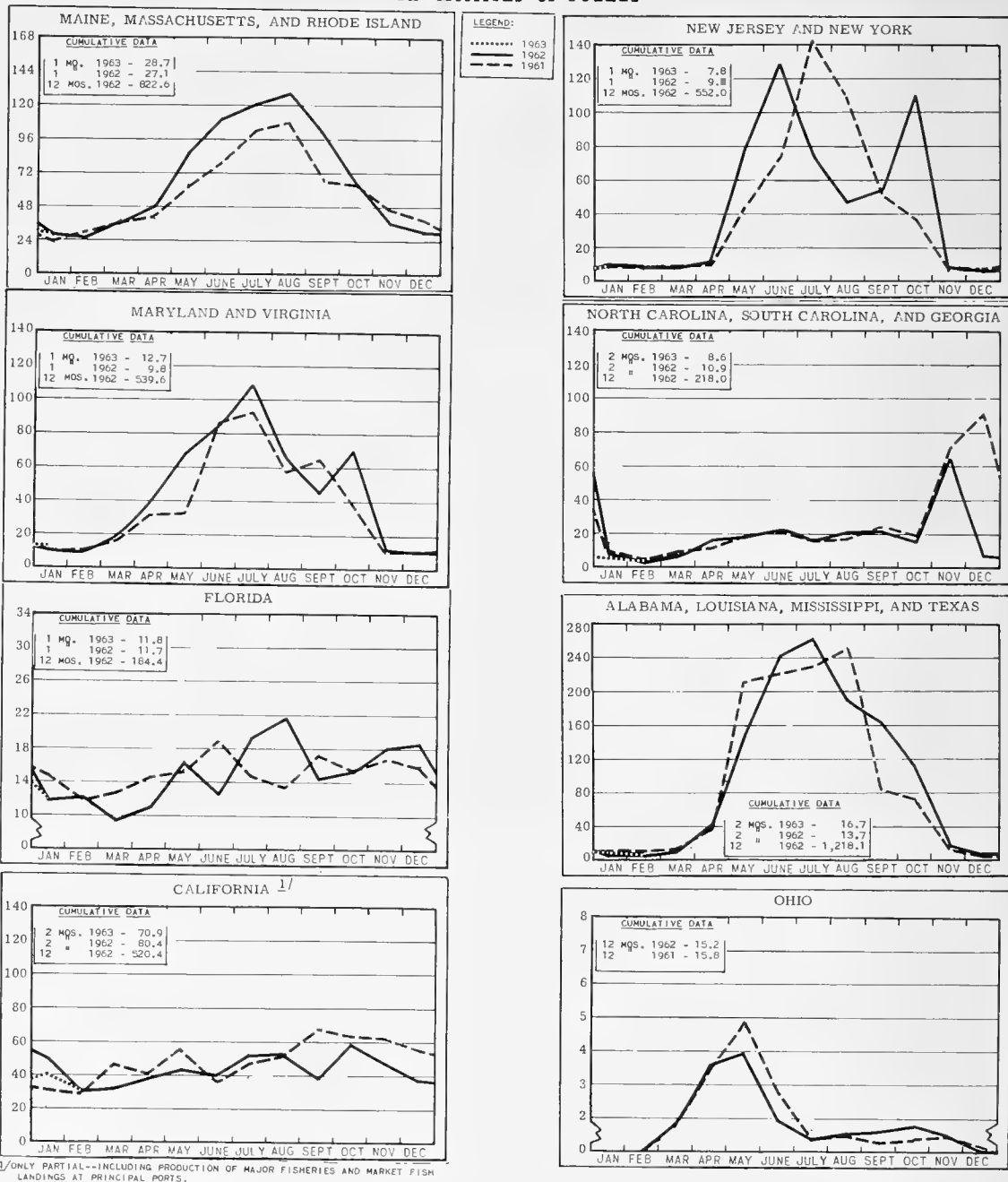
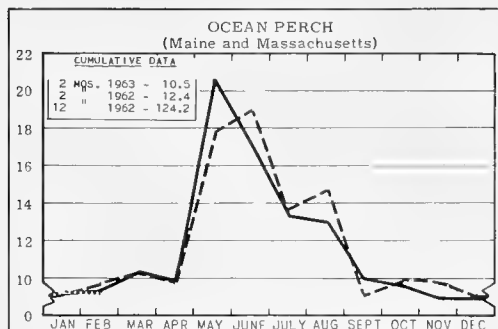
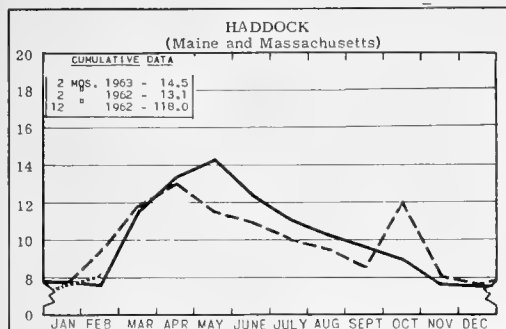
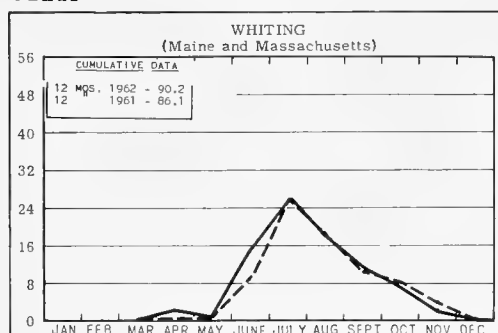
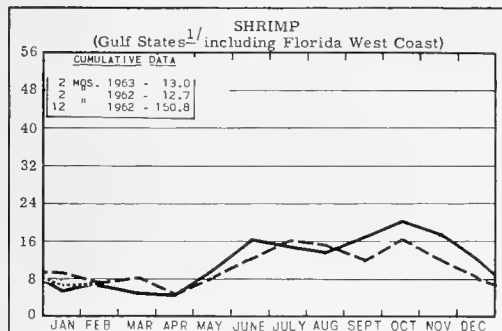


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

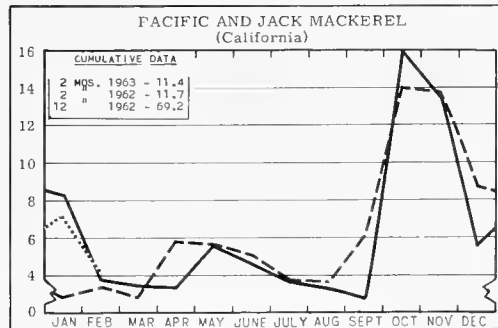
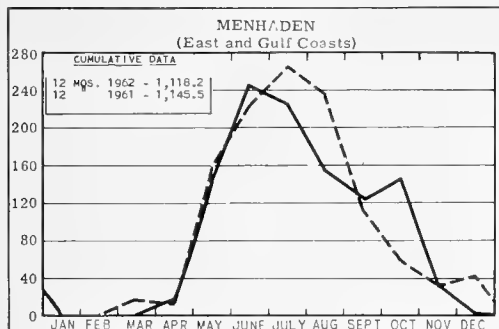


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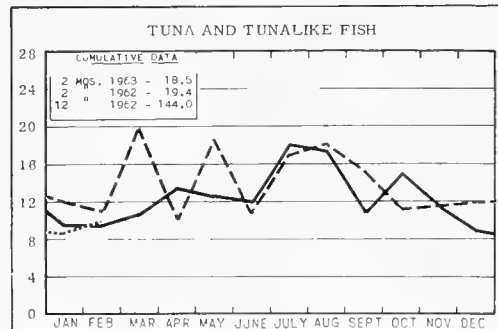
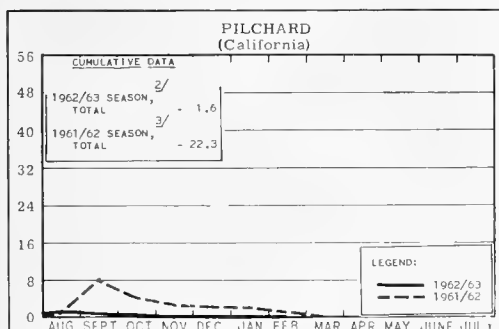


^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



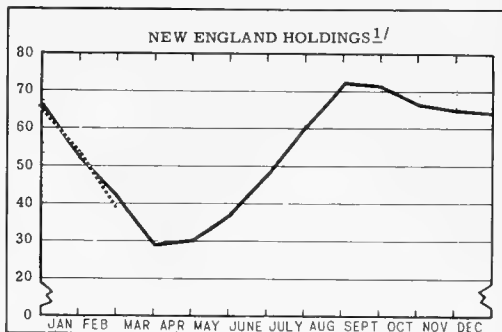
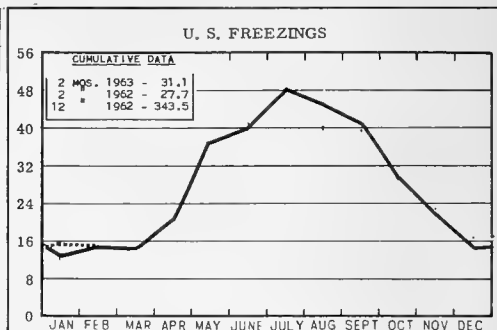
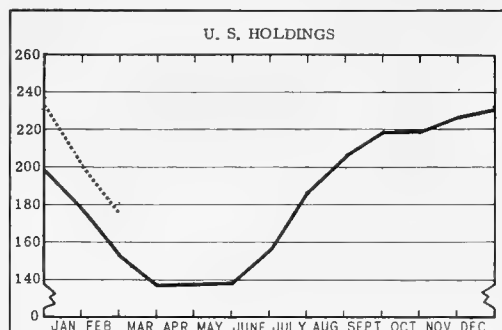
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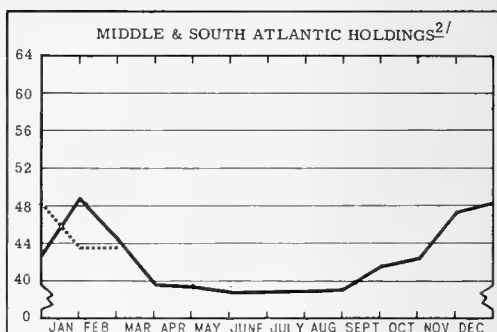
^{2/}SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963. ^{3/}SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

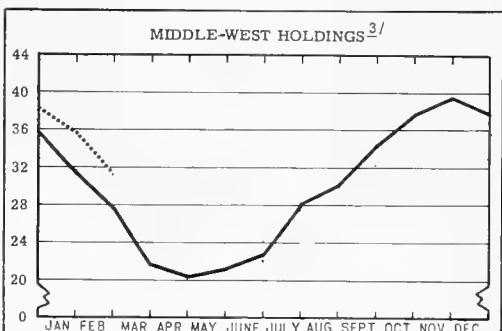
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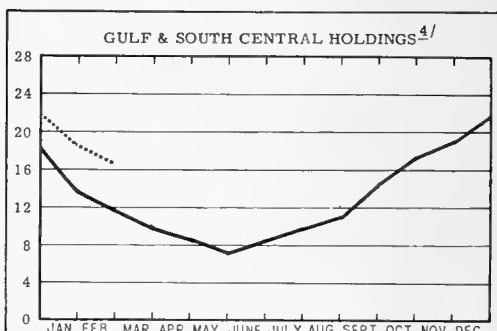
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



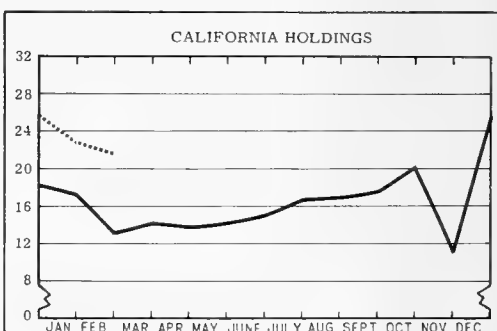
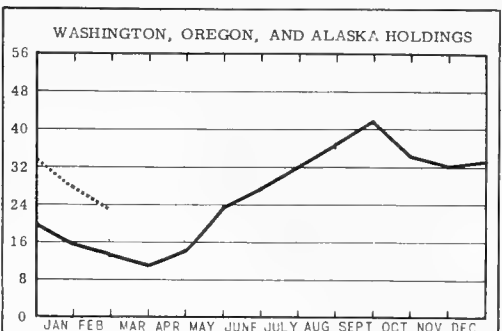
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



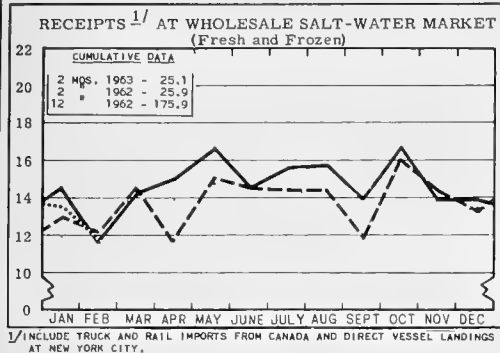
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



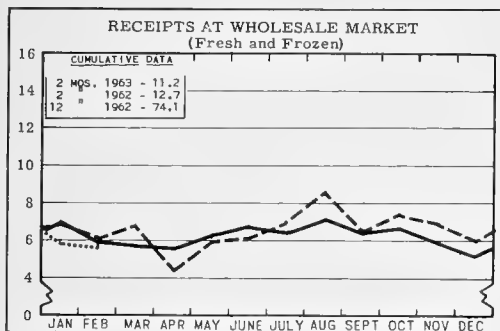
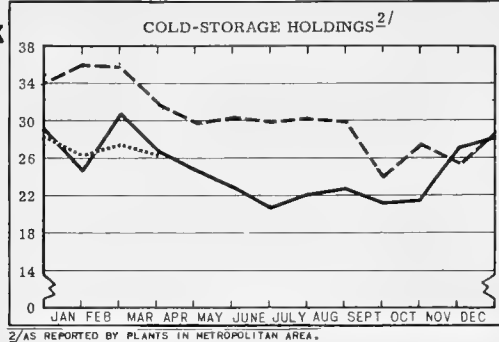
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

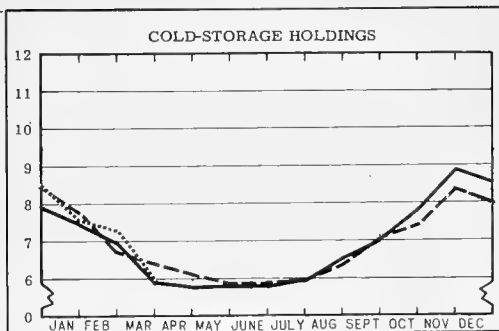
In Millions of Pounds



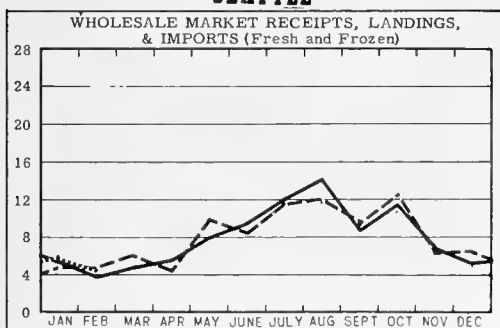
NEW YORK CITY



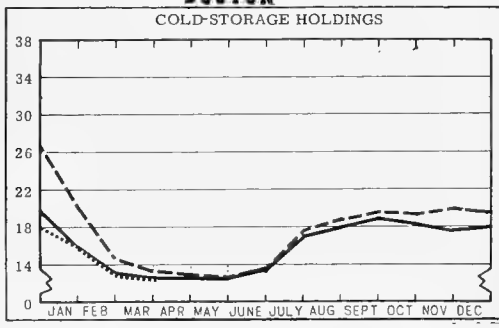
CHICAGO



SEATTLE



BOSTON



LEGEND:
 1963
 ——— 1962
 - - - 1961

CHART 5 - FISH MEAL and OIL PRODUCTION

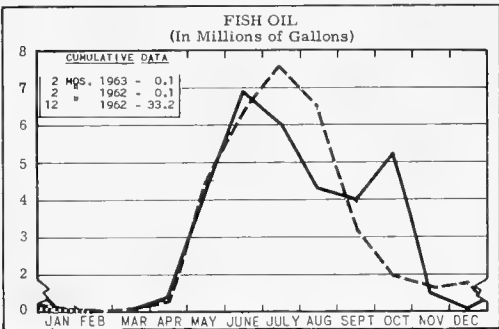
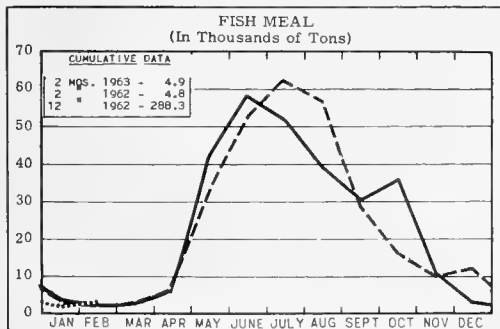
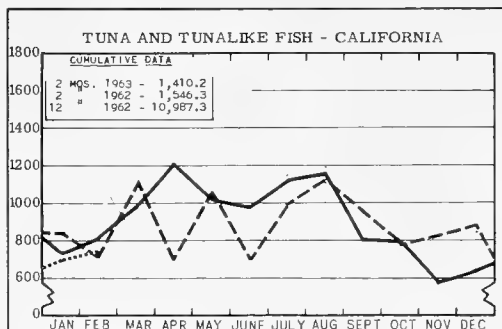
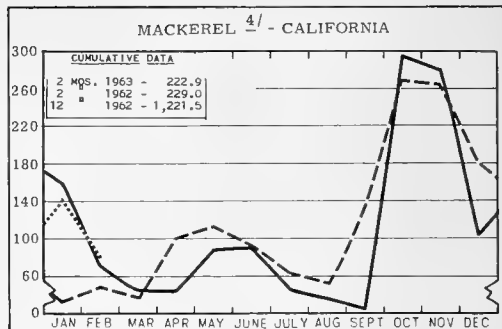


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

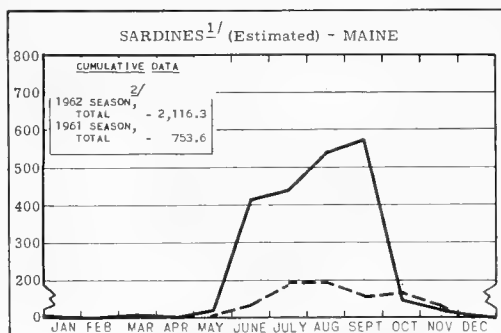
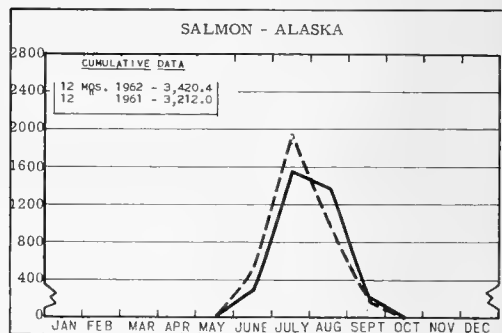
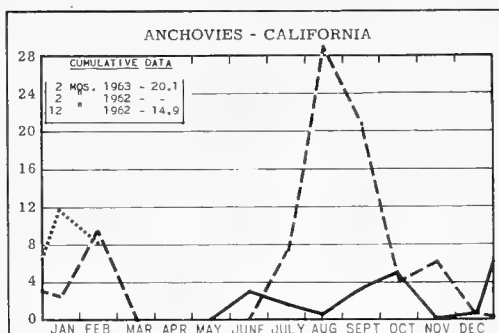
In Thousands of Standard Cases



LEGEND:
..... 1963
—— 1962
--- 1961



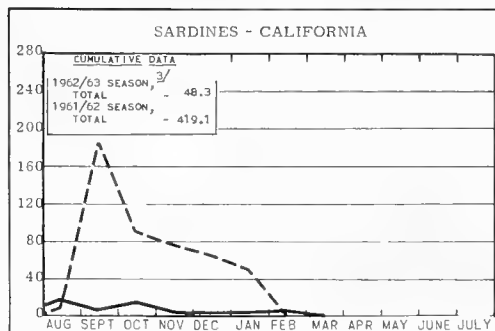
⁵/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



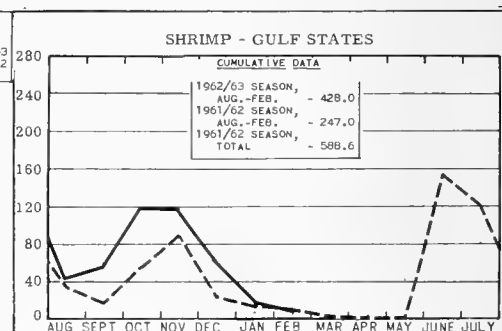
¹/ INCLUDING SEA HERRING. ²/ THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¹ / ₄ drawn	3 ¹ / ₂ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ¹ / ₂ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	¹ / ₂ -lb.	8 oz.



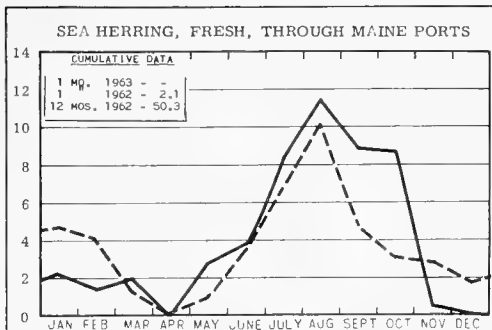
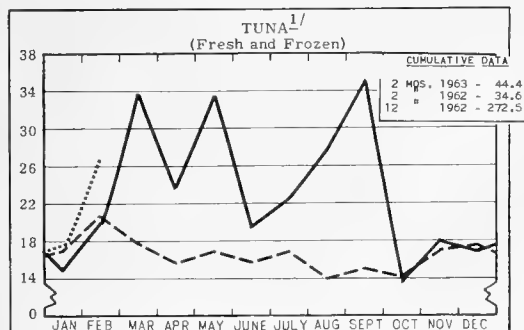
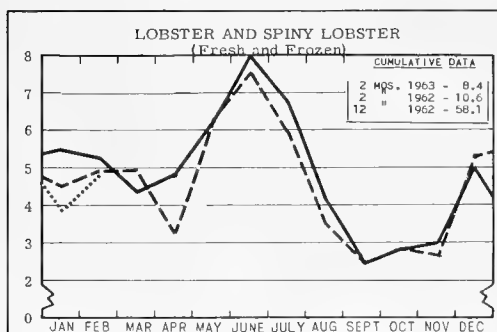
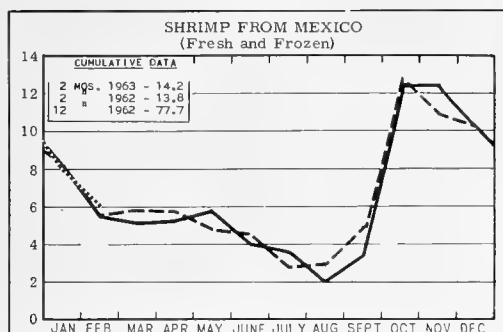
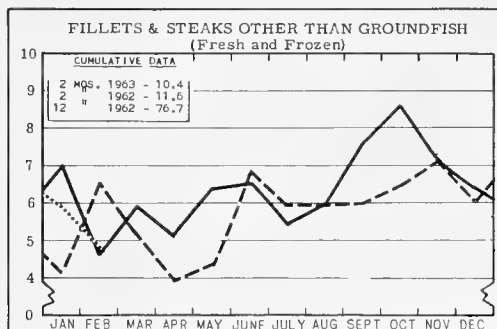
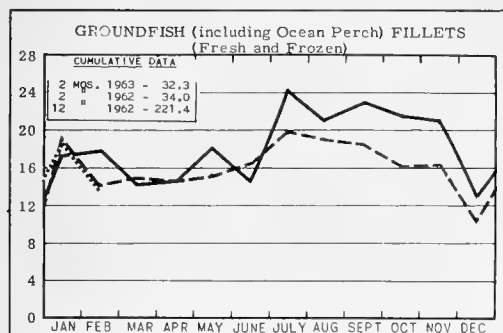
LEGEND:
..... 1962/63
—— 1961/62



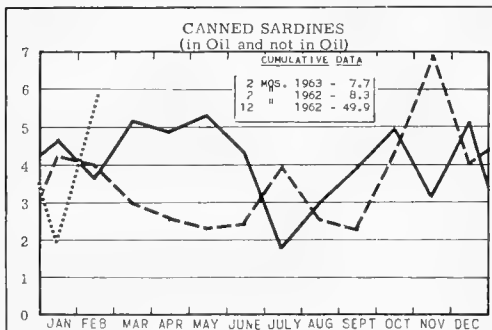
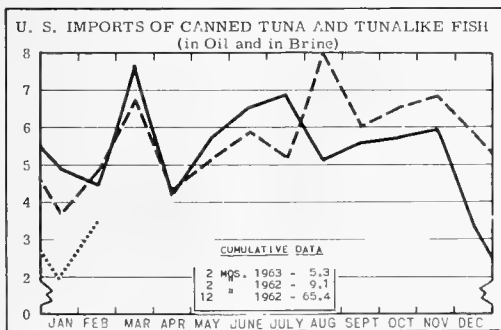
³/SEASON TOTAL, AUGUST 1, 1962-FEBRUARY 28, 1963.

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
 FL - FISHERY LEAFLETS.
 MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
 SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS- FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|--|
| CFS-3032 | - Alaska Fisheries, 1961 Annual Summary, 8 pp., (Revised). |
| CFS-3073 | - Shrimp Landings, July 1962, 8 pp. |
| CFS-3080 | - Frozen Fish Report, December 1962, 8 pp. |
| CFS-3082 | - Florida Landings, November 1962, 8 pp. |
| CFS-3089 | - Louisiana Landings, November 1962, 2 pp. |
| CFS-3093 | - Manufactured Fishery Products, 1961 Annual Summary, 7 pp. |
| CFS-3095 | - New York Landings, November 1962, 4 pp. |
| CFS-3096 | - Fish Sticks and Fish Portions, October-December 1962, 2 pp. |
| CFS-3097 | - California Landings, October 1962, 4 pp. |
| CFS-3098 | - Maine Landings, November 1962, 4 pp. |
| CFS-3101 | - Virginia Landings, November 1962, 4 pp. |
| CFS-3102 | - Frozen Fishery Products, 1962 Annual Summary, 14 pp. |
| CFS-3103 | - Louisiana Landings, December 1962, 2 pp. |
| CFS-3104 | - Rhode Island Landings, November 1962, 3 pp. |
| CFS-3108 | - Fish Meal and Oil, December 1962, 2 pp. |
| CFS-3109 | - Florida Landings, December 1962, 3 pp. |
| CFS-3110 | - Maryland Landings, December 1962, 3 pp. |
| CFS-3114 | - Georgia Landings, December 1962, 2 pp. |
| CFS-3116 | - South Carolina Landings, December 1962, 2 pp. |
| FL-28 | - Fish Baits: Their Collection, Care, Preparation, and Propagation, 25 pp., August 1962 (Revised). |
| FL-293 | - List of Fishermen's and Fish Shore Workers' Unions in the United States, 8 pp., August 1962 (Revised). |
| FL-444 | - Some Publications on Game-Fish and Sport Fishing, 11 pp., June 1962 (Revised). |
| FL-459 | - Freshwater Fish Diseases Caused by Bacteria Belonging to the Genera <u>Aeromonas</u> and <u>Pseudomonas</u> , by S. F. Snieszko, 7 pp., August 1962 (Revised). |
| FL-538 | - Silver Hake, by Raymond L. Fritz, 9 pp., illus., May 1962. The silver hake or whiting (<u>Mer-</u> |

luccius bilinearis) is one of the few fish used for a variety of products--for human food, reduction, and animal food. It is one of the most abundant fish of our Atlantic coast and is sought by a large and varied fleet. This leaflet discusses the distribution and movements of the silver hake; its spawning, tagging, growth, and feeding habits. Also covers the commercial fishery, how silver hake are caught, and methods of handling and processing.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON 5, D. C.

- | Number | Title |
|---|--|
| MNL-52 | - Menhaden Fish Oil Prices--New York City, 1950-1962 and January 1963, 6 pp. |
| Sep. No. 669 | - Present and Future Factors that May Influence Fish Meal Demand. |
| Sep. No. 670 | - Oyster Industry of Chesapeake Bay, South Atlantic, and Gulf of Mexico. |
| Sep. No. 671 | - Eradication of Piranha in Inland Waters. |
| SSR-Fish. No. 405 | - Interchange of Stream and Intra-gravel Water in a Salmon Spawning Riffle, by Walter G. Vaux, 15 pp., illus., March 1962. |
| SSR-Fish. No. 425 | - Chum Salmon Resources of Alaska from Bristol Bay to Point Hope, by Chester R. Mattson, 25 pp., illus., May 1962. |
| SSR-Fish. No. 426 | - An Electrical Oxygen-Temperature Meter for Fishery Biologists, by Kermit E. Sned and Harry K. Dupree, 16 pp., illus., June 1962. |
| SSR-Fish. No. 432 | - Protein and Calorie Levels of Meat-Meal, Vitamin-Supplemented Salmon Diets, by Bobby D. Combs and others, 10 pp., July 1962. |
| SSR-Fish. No. 436 | - Oceanographic and Biological Data, Hawaiian Waters, January-July 1961, by Kenneth Sherman and Robert P. Brown, 46 pp., illus. July 1962. |
| <u>America's Rare Sea Mammals</u> , Conservation Note 9, 8 pp., illus., processed, June 1962. Discusses characteristics of sea mammals and their near-extinction along the coasts of North America. Describes the sea otter, northern fur seal, Guadalupe fur seal, Pacific walrus, and polar bear. Also covers the | |

northern elephant seal, Hawaiian monk seal, Florida manatee, "right" whales, and gray whales.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, December 1962, 8 pp. (Market News Service, U.S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparison with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, January 1963, 13 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; and ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, January 1963, 19 pp., illus. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, January 1963, 13 pp. (Market News Service, U.S. Fish and Wildlife Service, U. S. Customs House, 610 South Canal St., Room 1014, Chicago 7, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, January 1963, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, Room 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1963, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Box 447, Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and

Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, January 1963, 23 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data of fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, January 1963, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Avenue, Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Bioassay and Use of Pituitary Materials to Spawn Warm-Water Fishes, by Howard P. Clemens and Kermit E. Sneed, Research Report 61, 35 pp., illus., 25 cents, 1962.

"Development and Distribution of the Short Bigeye, *Pseudopriacanthus altus* (Gill), in the Western North Atlantic," by David K. Caldwell, Fishery Bulletin 203 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 103-150), 52 pp., illus., printed, 35 cents, 1962.

"Effect of Certain Electrical Parameters and Water Resistivities on Mortality of Fingerling Silver Salmon," by John R. Pugh, Fishery Bulletin 208 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 223-234), 16 pp., illus., printed, 15 cents, 1962.

"Food of Albacore Tuna, *Thunnus germon* (Lacepede), in the Central and Northeastern Pacific," by Robert T. B. Iversen, Fishery Bulletin 214 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62 pp. 459-481), 27 pp., illus., printed, 25 cents, 1962.

"Hydrological Characteristics of Tampa Bay Tributaries," by Alexander Dragovich and Billie Z. May, Fishery Bulletin 205 (from Fishery Bulletin of the Fish and

Wildlife Service, vol. 62, pp. 163-176), 18 pp., illus., printed, 20 cents, 1962.

Limnological Organic Analyses by Quantitative Dichromate Oxidation, by John A. Maciolek, Research Report 60, 67 pp., illus., 40 cents, 1962.

"Midwater Trawling for Forage Organisms in the Central Pacific 1951-1956," by Joseph E. King and Robert T. B. Iversen, Fishery Bulletin 210 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 271-321), 55 pp., illus., printed, 40 cents, 1962.

"Relationships among North American Salmonidae," by George A. Rounsefell, Fishery Bulletin 209 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 235-270), 40 pp., illus., printed, 30 cents, 1962.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

*ANY LISTED PUBLICATION PRECEDED BY AN ASTERISK IS AVAILABLE ON LOAN FROM THE NATIONAL LENDING LIBRARY FOR SCIENCE AND TECHNOLOGY, D. S. I. R., BOSTON SPA, YORKSHIRE, ENGLAND.

ALGAE:

Physiology and Biochemistry of Algae, by Ralph A. Lewin, 929 pp., illus., printed \$32. Academic Press Inc., 125 E. 23rd St., New York 10, N. Y., 1963. A reference source covering the major topics in experimental phycology, the study of algae as living organisms, and summarizing much of the recent progress in the field.

"Protein Value and the Amino Acid Deficiencies of Various Algae for Growth of Rats and Chicks," by G. A. Leveille, H. E. Sauberlich, and J. W. Shockley (Fitzsimons General Hospital, Denver, Colo., article, Journal of Nutrition, vol. 76, April 1962, pp. 423-428, printed, American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

ARCTIC:

"Arctic Research Poses Many Problems," by Bruce Woodland, article, Trade News, vol. 15, no. 3, September 1962, pp. 8-10, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Describes the experiences of a scientific team, including a fisheries specialist, which carried out studies on the Prince Gustaf Adolph Sea, in an area roughly six hundred miles from the North Pole, in the spring of 1961. No fish was taken, but plankton hauls to depths of 400 feet yielded some shrimp-like organisms. Many important contributions to the fields of oceanography and biology of arctic seas were made, according to the author.

ARCTIC CHAR:

"Landlocked Arctic Char in Newfoundland," by J. J. Quigley, article, Trade News, vol. 15, no. 3, Sep-

tember 1962, pp. 11-12, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. First reported in Newfoundland in 1949, the landlocked Arctic char (Salvelinus alpinus) has since been discovered to be distributed widely in the lakes and ponds throughout the province. A Canadian Department of Fisheries survey of this species in 1958 produced valuable information on spawning and growth. Originally an anadromous species, in many areas the Arctic char has become completely cut off from migration to salt-water and has adapted to living as a fresh-water fish. Potentialities for a sport fishery are excellent, according to the author.

AUSTRALIA:

Commonwealth of Australia Fishing Industry Act 1956, Sixth Annual Report, 8 pp., processed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia, 1962. The sixth annual report on operations of the Trust Account during 1961-62. The Fisheries Development Trust Account was established under the Act for the purpose of financing activities towards the development of the fishing industry in Australia. This report discusses the Trust Account, applications for assistance, the Great Australian Bight trawling project, and the Western Australia tuna survey. Also covers the training school for fisheries field officers, research on Western Australian crayfish, and other related information.

BEHAVIOR OF FISH:

"Notions of Niche and Competition among Animals, with Special Reference to Freshwater Fish," by A. H. Weatherley, article, Nature, vol. 197, no. 4862, January 5, 1963, pp. 14-17, illus., printed, single copy 4s. (about 56 U.S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

BEHEADING FISH:

"Beheading of Fish," by R. G. T. Baader, article, Food Manufacture, vol. 37, June 1962, p. 306, printed. Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

BIOCHEMISTRY:

"A Preliminary Report on the Performic Acid Oxidation Products of Fish, Whale, and Ox Insulins," by Sasao Nishizaki, article, Chemical Abstracts, vol. 55, November 13, 1961, 23604i, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

BYPRODUCTS:

"Fish Byproducts: Preservation of Raw Material" article, Torry Research Station, Annual Report 1960, p. 27, printed. Torry Research Station, Aberdeen, Scotland, 1961.

CAMEROON FEDERAL REPUBLIC:

Investment Law of the Federal Republic of Cameroon, OBR-62-32, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the investment code of the French Republic of Cameroon, and background and related information of use to possible United States investors.

CANADA:

Boatbuilding and Repair (Formerly The Boat Building Industry), 1960, 15 pp., printed, 50 Canadian cents.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Queen's Printer and Controller of Stationery, Ottawa, Canada, 1963. Data presented in this report reflect the implementation of the revised Standard Industrial Classification (SIC) which is being used by the Dominion Bureau of Statistics in its compilation of 1960 industry statistics. An annual census of manufacturers covering establishments primarily engaged in building and repairing all types of boats.

"Canada's Trade Relations with South American Countries," article, *Foreign Trade*, vol. 118, no. 12, December 15, 1962, pp. 28-30, printed, single issue 20 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada.

Fisheries Statistics, Alberta and Northwest Territories, 1961, 22 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, February 1963. Contains tables giving the value of fish landed in Alberta, 1954-1961; and the quantity and value of fish landed by fisheries districts, 1960-1961. Also contains tables showing value of fish landings in the Northwest Territories, 1954-1961; quantity and value of fishery products by species, 1960-1961; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Manitoba, 1961, 11 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, January 1963. Contains tables giving the value of fish landed in Manitoba, 1954-1961; quantity and value of landings by species and fisheries districts, 1960-1961; quantity and value of fishery products by species; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Newfoundland, 1961, 26 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, December 1962. Contains tables giving the value of fish and shellfish landed in Newfoundland, 1957-1961; quantity and value of landings by species and fisheries areas, 1960-1961; quantity and value of fishery products by species; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Ontario, 1961, 12 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, December 1962. Contains tables giving the value of fish landed in Ontario, 1954-1961; quantity and value of landings by species and fisheries districts, 1960-1961; capital equipment used in the primary fisheries operations; number of persons engaged in the fisheries; and new capital investment in the commercial fishery.

Fisheries Statistics, Prince Edward Island, 1961, 25 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, February 1963. Consists of tables giving the quantity and value of fish and shellfish landed in Prince Edward Island, 1949-1961; quantity and value of landings by species and fisheries districts, 1960-1961; capital investment in the commercial fisheries; classification of powered

fishing craft by over-all length; persons engaged in primary operations by fisheries districts and in the major fisheries of Prince Edward Island.

Fisheries Statistics, Saskatchewan, 1961, 9 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, January 1963. Contains data on the value of fish landed in Saskatchewan, 1954-1961; quantity and value of landings by species, 1960-1961; quantity and value of landings by major species and by lakes; capital equipment in primary fisheries operations; and the number of persons engaged in the primary fisheries operations.

CANNED FISH:

"Accumulation of Salts of Tin in Canned Fish," by F. M. Purikov, article, *Izvest. Vysshikh Ucheb. Zavedenii Pishch. Tekh.*, vol. 4, no. 23, 1961, pp. 100-105, printed. *Izvest. Vysshikh Ucheb. Zavedenii Pishch. Tekh.*, Izd Krasnodarskogo Inst. Tishchevoi Promyshlennosti, Ul. Krasnaya, 135, Krasnodar, U.S.S.R.

"Total Weight and Fish Content of Canned Fish," by W. Schwabe, article, *Deutsche Lebensmittel-Rundschau*, vol. 57, 1961, pp. 62-68, printed. *Deutsche Lebensmittel-Rundschau*, Wissenschaftliche Verlagsgesellschaft, m.b.H., Postfach 40, Stuttgart 1, Germany.

CANNING:

"Canning: Chemical Changes in Herring during Heat Processing," article, *Torry Research Station, Annual Report 1960*, pp. 25-26, printed. *Torry Research Station*, Aberdeen, Scotland, 1961.

"Experiments on Canning Fresh-Water Fish. II--Smelts from West End of Lake Erie," by A. W. Lantz, and L. C. Dugal, article, *Progress Reports of the Biological Station and the Technological Unit No. 1*, pp. 28-30, printed. *Fisheries Research Board of Canada, Technological Unit*, London, Ontario, Canada, September 1959.

"The Manufacture of Sterilized Mussel and Oyster Products," by H. Houwing, article, *Conserva*, vol. 10, no. 2, 1961, pp. 29-31, printed in Dutch. *Moorman's Periodieke Pers N.V.*, 1 Zwarteweg, The Hague, Netherlands.

CHILE:

Informe de las Actividades Desarrolladas durante la Expedición MAR--CHILE II (Report on the Activity Developments during the Expedition "Sea--Chile II"), by Omar Rojas Jara, 16 pp., processed in Spanish. *Ministerio de Agricultura, Departamento de Pesca y Caza*, Santiago, Chile, August 1962.

"Proyecto sobre Producción y Desarrollo de Peces de Importancia Comercial en el Norte de Chile" (Project for the Production and Development of Fish of Commercial Importance in Northern Chile), by Walter Fischer and Luis Ramorino, *Divulgación Pesquera Cartilla No. 5*, August 1962, 14 pp., illus., processed in Spanish. *Ministerio de Agricultura, Dirección de Agricultura y Pesca, Departamento de Pesca y Caza*, Santiago, Chile.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

CLAMS:

"Animal Food from Clam Waste," by John Marvin and Edward E. Anderson, article, Chemical Abstracts, vol. 56, April 16, 1962, 9182g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Proteins of Shellfish. IX--Components of Shell Liquid of Clam," by H. Baba, article, Chemical Abstracts, vol. 55, October 30, 1961, 22629e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

COMMON MARKET:

"The Common Market: How Would Entry Affect Britain's Fishing Industry?" article, World Fishing, vol. 12, no. 1, January 1963, pp. 58-60, 63, illus., printed, single copy 3s. (about 42 U.S. cents). World Fishing, John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

COMPOSITION:

"Acid-Soluble Phosphorus Compounds and Free Sugars in Fish Muscle and Their Origin," by H. L. A. Tarr and M. Leroux, article, Canadian Journal of Biochemistry and Physiology, vol. 40, May 1962, pp. 571-589, printed. National Research Council, Ottawa, Canada.

"Chemical Composition of Some South African Marine Products," by P. G. Celliers, article, Chemical Abstracts, vol. 56, May 14, 1962, 12044c, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Seasonal Variations of Chemical Composition of Fish," by Eliezer de Carvalho Rios (Ministry of Agriculture, Rio Grande, Brazil), article, Chemical Abstracts, vol. 56, July 9, 1962, 1389d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

CONGO REPUBLIC (BRAZZAVILLE):

Investment Law of the Republic of Congo (Brazzaville), by A. A. Wilken, Jr., OBR-62-15, 12 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Contains the full text of the Investment Code of the Republic of the Congo (Brazzaville), and presents details of its enactment. The Code sets forth certain rights or guarantees of all business ventures in the country and establishes three categories under which fiscal and other privileges can be accorded to firms investing in new industries or expanding existing industrial activities.

CRAB MEAT:

"Prevention of Formation of Magnesium Ammonium Phosphate in Canned Crabs," by Akio Yamada, article, Chemical Abstracts, vol. 56, June 11, 1962, 14683d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

DEEP-SEA DIVING:

"Physiological Problems of Deep-Sea Diving," by Stanley Miles, article, New Scientist, vol. 15, no. 306, September 27, 1962, pp. 671-673, illus., printed. New Scientist, Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

DEFROSTING:

"Defrosting Foods by Radio Frequency," article, Food Technology, vol. 16, July 1962, pp. 27-28, printed, The Garrard Press, 510 N. Hickory, Champaign, Ill.

DENMARK:

Fiskeriberetning for Aret 1961 (The Ministry of Fisheries Annual Report for 1961), 137 pp., illus., printed in Danish with English summary, Kr. 7.50 (about US\$1.09). Fiskeriministeriet, 1 Kommission Hos. G.E.C. Gad, Copenhagen, Denmark. A report on the Danish fishing industry during 1961. Includes information and statistical tables on number of fishermen employed, fishing fleet, fishing gear, and landings of fish and shellfish. Also contains information on trout farms; production of canned, filleted, and smoked fish; and foreign trade in fishery products.

ECHO-SOUNDER:

"Searching the Sea with Sound," by D. G. Tucker, article, New Scientist, vol. 15, July 19, 1962, pp. 134-136, printed. New Scientist, Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

ECOLOGY:

"Controlling Experimental Conditions in Studies of Eggs and Larvae of Aquatic Forms," by V. L. Loo-sanoff, article, American Zoologist, vol. 2, no. 3, August 1962, pp. 426-427, printed. American Society of Zoologists, 104 Liberty St., Utica, N. Y.

ECUADOR:

Industrial Development Law of Ecuador, by Lawrence J. Comella, OBR-62-17, 12 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, 25, D. C.) Discusses the old Law of 1957 and the new emergency decree-law of August 9, 1962, promulgated to further Ecuador's industrialization. "The replacement of imports by goods manufactured in Ecuador and the production of new items for exportation would constitute the elements that would produce this effect," according to the report. Includes, also, a translation of the new law.

FARM PONDS:

Fish Management in New York Farm Ponds, by A. W. Eipper and H. A. Regier, Cornell Extension Bulletin 1089, 36 pp., illus., printed. New York State College of Agriculture, Cornell University, Ithaca, N. Y., July 1962. Discusses the types of fish suitable to stocking, location and construction features, stocking regulations and sources of fish, and pond maintenance. Also covers the biology and management of trout ponds, bass-shiner ponds, bass-bluegill ponds, and others. According to the authors, "There are more than 18,000 farm ponds in New York State and new ones are being constructed at the rate of about 1,000 a year."

FAUNA:

MEEKIA: Enigmatic Cretaceous Pelecypod Genus, by Louella Rankin Saul and Willis Parkison Pope, 55 pp., illus., printed, \$1.25. University of California Press, Berkeley 4, Calif., 1963.

FEDERAL INCOME TAX:

Rules for Deducting Travel, Entertainment, and Gift Expenses for 1962; New Recordkeeping Rules for

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

1963, Document No. 5049 (1-63), 20 pp., printed, Internal Revenue Service, U. S. Treasury Department, Washington 25, D. C., 1963. Aid to taxpayers in filing 1962 returns and new recordkeeping rules for 1963 are presented. Expenses for business travel, for entertaining customers, clients, and other business contacts, and for business gifts are deductible under certain circumstances. During 1962 Congress enacted new rules for these expenditures which are effective after December 31, 1962. The leaflet is divided into two main parts. The first part explains the rules in effect for such expenditures before January 1, 1963, which should be followed in filing income tax returns for 1962. The second part explains the new rules for such expenditures after December 31, 1962, with the emphasis on the stricter requirements for current recordkeeping and substantiation.

FISH BEHAVIOR:

"Alarm Reaction of the Top Smelt, *Atherinops affinis* (Ayres)," by W. A. Skinner, R. D. Mathews, and R. M. Parkhurst, article, *Science*, vol. 138, no. 3541, November 9, 1962, pp. 681-682, printed, single copy 35 cents, *Science*, 1515 Massachusetts Ave. NW., Washington 5, D. C. The "alarm" substance of the smelt has been isolated by extraction with methanol or ether from suffocated smelt. These concentrated extracts, when introduced into an aquarium containing smelt, induce a strong alarm reaction in the fish, characterized by rapid swimming, jumping, and often severe seizures. The fact that extracts from some other species caused only mild excitation in the smelt indicates the species-specificity of the alarm reaction.

*Sekret Ryb'ikh Stai (The Secret of Fish Schools), by E. P. Fedorovskii, R 24468, printed in Russian, 1960.

FISHERY MANAGEMENT:

*Forelevoe Rybovodnoe Khoziaistvo (Management of Trout Fishery), by K. A. Sadlaev, R 24637, printed in Russian, 1962.

FISH FLAVOR:

"A Study of the Influence of Selected Preparation Procedures on Flavor and Aroma of Fish," by Ruth E. Baldwin, Dorothy Hussemann Strong, and James H. Torrie, article, *Food Technology*, vol. 16, July 1962, pp. 115-118, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

FISH HYDROLYSATES:

"Fish Hydrolysates, Pastes, and Sauces," by N. L. Lahiry and D. P. Sen (Central Food Technological Research Institute, Mysore, India), article, *Chemical Abstracts*, vol. 56, March 19, 1962, 64291, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Fish Hydrolysates. I--Rate of Hydrolysis of Fish Flesh with Papain," by D. P. Sen and others; and "II--Standardization of Digestion Conditions for Preparation of Hydrolysates Rich in Peptones and Proteoses," by N. V. Sripathy and others, articles, *Food Technology*, vol. 16, May 1962, pp. 138-142, printed. Central Food Technological Research Institute, Mysore, India.

FISHING EFFORT:

"On the Mechanism of Fishing in which Distribution Curve of Catch Per Unit Effort is Very Like Logarithmic Distribution," by Tadashi Yamamoto, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, February 1961, pp. 137-142, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

FISHING LAMPS:

"A Study of Effects of Different Kinds of Fishing Lamps," by Yoshinobu Isa, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, June 1961, pp. 493-500, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

FISHING WITH LIGHTS:

"Lumieres sur l'Atlantique--Venu de la Mediterranee le Lamparo 'gagne' la Bretagne" (Lights on the Atlantic--the Mediterranean "Lamparo" Introduced to Brittany), by J. Regnier, article, *France Pêche*, vol. 7, no. 65, September 1963, pp. 19-25, 27, illus., printed in French. France Pêche, Boite Postale 179, Lorient (Morbihan), France.

FISH MEAL:

"Fish Meal Malodours," by G. M. Dreosti and S. G. Wiechers (Fishing Industry Research Institute, University of Cape Town, South Africa), article, *Fishing News International*, vol. 1, April 1962, pp. 35-39, printed. A. J. Heighway Publications Ltd., 110 Fleet St., (Ludgate House), London EC4, England.

"Fish Meal--Present and Future," by Clarence F. Winchester, article, *Feedstuffs*, vol. 34, September 22, 1962, pp. 34-36, printed. Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"The Operation of Stream pumps in the Fishmeal industry," by W. Luhr, article, *Fette Seifen Anstrichmittel*, vol. 64, May 1962, pp. 445-446, printed. Fette Seifen Anstrichmittel, Industrie Verlag von Hernhausen K. G., Hamburg 11, Germany.

FISH OILS:

"Stability of Dienoic Acids Contained in Hydrogenated Whale and Fish Oils," by Hisashi Watanabe and Yoshiyuki Toyama, article, *Chemical Abstracts*, vol. 55, December 25, 1961, 27923a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Studies on Utilization of Oils and Fats Obtainable from Viscera of Aquatic Animals," by Hiroshi Sone, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, December 1961, pp. 1100-1106, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

FISH PROTEIN CONCENTRATE:

"Factors Influencing the Nutritional Value of Fish Flour. I--Effects of Extraction with Chloroform or Ethylene Dichloride," by A. B. Morrison, Z. I. Sabry, and E. J. Middleton (Food and Drug Laboratories, Department of National Health and Welfare, Ottawa, Canada), article, *Journal of Nutrition*, vol. 77, May

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1962, pp. 97-104, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

"The Nutritional Value of Fish Flour (Fish Protein Concentrate)," by A. B. Morrison and J. A. Campbell (Department of National Health and Welfare, Ottawa, Canada), article, Chemical Abstracts, vol. 56, May 28, 1962, 13315f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"The Nutritive Value of the Mineral Components of a South African Fish Flour (Fish Protein Concentrate), with Special Reference to the Effect of Supplementation with Potassium," by D. B. Du Bruyn and J. J. Dreyer (National Nutrition Research Institute, Pretoria, South Africa Republic), article, Chemical Abstracts, vol. 57, July 9, 1962, 1348c, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Studies on Fish Flour (Fish Protein Concentrate)," by V. Subrahmanyam and others, article, Food Science, vol. 11, no. 2, 1962, pp. 37-61, printed. Central Food Technological Research Institute, Mysore, India.

FISH SOLUBLES:

"Evaluation of Condensed Fish Solubles as a Chick Growth Stimulant in an 8-year Study," by Robert J. Lillie, H. Menge, and C. A. Denton, article, Poultry Science, vol. 41, July 1962, pp. 1202-1206, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

FRANCE:

La Peche Maritime, vol. 41, no. 1017, December 1962, 180 pp., illus., printed in French, 22.50 NF (about US\$4.57). La Peche Maritime, 190, Boulevard Haussmann, Paris 8e, France. The annual issue is devoted to accomplishments in 1962 and prospects for the marine fishery industries in 1963. Articles are grouped under the subjects of the Common Market, vessel construction, fishery ports, and general information. Included, among others, are the following articles: "Les surcharges particulieres qui pesent sur la peche francaise doivent disparaitre" (Specific Burdens with which the French Fishery is Beset Must Vanish), by M. Rouge; "Le plan de relance de l'economie des peches" (Plan to Restore Economy of the Fisheries), by Rene Thibaudau; and "Comment fonctionnent les institutions de la Communauté economique europeene" (How Institutions of the European Economic Community Function).

FREEZE-DRYING:

"Denaturation of Fish Protein by Freeze-Drying," by Juichiro J. Matsumoto (Tokai Regional Fisheries Expt. Sta., Tokyo), article, Chemical Abstracts, vol. 56, May 28, 1962, 13306i, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Enzymic Activity at Low Moisture Levels and Its Relation to Deterioration in Freeze-Dried Foods," by N. A. Matheson (Ministry of Agriculture, Fisheries, and Food, Research Establishment, Aberdeen, Scotland), article, Journal of the Science of Food and Agriculture, vol. 13, April 1962, pp. 248-254, printed. The Society of Chemical Industry, 14 Belgrave Sq. London SW1, England.

"Faster Packaging Improvements Needed for Freeze-Drieds," by John H. Nair, article, Food Engineering, vol. 34, June 1962, pp. 44-46, printed. Chilton Company, Chestnut and 56th Sts., Philadelphia 36, Pa.

"Freeze-Drying in Europe Today," by Robert M. Kolodny, article, Food Processing, vol. 23, January 1962, pp. 38-40, 43-44, printed. Putnam Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

"Freeze-Dry Systems Changing," by John H. Nair, article, Food Engineering, vol. 34, June 1962, pp. 41-43, printed. Chilton Company, Chestnut and 56th Sts., Philadelphia 36, Pa.

"Packaging of Freeze-Dried Foods," by T. H. Angel, article, Food Manufacture, vol. 37, April 1962, pp. 157-158, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

"A Short Guide to Freeze-Drying," by J. McN. Dalglish, article, Food Manufacture, vol. 37, April 1962, pp. 151-156, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

FROZEN FISH:

"Fat Hydrolysis in Frozen Fish. II--Relation to Protein Stability," by Doris I. Fraser and W. J. Dyer, article, Progress Reports of the Atlantic Coast Stations, no. 72, pp. 37-39, printed. Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, September 1959.

"Use of Phosphates to Prevent Drip Loss in Frozen Fish," by John H. Mahon, article, Chemical Abstracts, vol. 57, October 15, 1962, 10318g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

GABON REPUBLIC:

Investment Law in the Republic of Gabon, by A. A. Wilken, Jr., OBR-62-20, 12 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. Discusses the investment code of the Republic of Gabon, and background and related information of use to possible United States investors.)

GEAR:

"The 'S' Shaped Fishpots of Jamaica," article, World Fishing, vol. 11, no. 12, December 1962, pp. 39-40, 43, illus., printed, single copy 3s. (about 42 U.S. cents). World Fishing, John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England. Fishpots are used extensively throughout the Caribbean where bottom conditions are generally too rough for trawling and the abundance of sharks limits the use of other bottom fishing methods. The two-funnel "S" pot used in Jamaica is traditional and is the most widely used fishing method on the island. This article discusses the operation and method of construction of the fishpot.

GENERAL:

The Fishes, by Uri Lanham, printed, C\$5. The Copp Clark Publishing Company, Ltd., 517 Wellington St., W., Toronto, Canada, 1962. An easily understood

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account of fish--their origin, the major groups into which they fall, and the structure of the species in these few groups. The evolutionary background needed to understand the structure of modern fish is discussed, after which the actual structure is described in chapters on such subjects as swimming, reproduction, and sense perception.

GERMAN FEDERAL REPUBLIC:

Customs Valuation under the Revised German Customs Law, Effective January 1962, OBR-62-22, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., January 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report on the new customs valuation procedure of the German Federal Republic. The new procedure, also applicable to West Berlin, was established in the Customs Valuation Code--Wert Zollordnung--of November 29, 1961. It took effect simultaneously with the enabling law on January 1, 1962. The report covers the principal provisions in the ordinance: normal price, invoice price, valuation of goods in special cases, and final provisions.

HANDLING FISH:

Practical Notes on the Care of the Trawlers Catch, by J. C. D. Watts, Fisheries Department Technical Paper No. 1, 6 pp., printed, 1s. (about 14 U. S. cents). Government Bookshop, Water St., Freetown, Sierra Leone, 1962.

HEMOTOLOGY:

"Variant Hemoglobin and Electrophoretic Whole Blood Studies in Two Tunas and Three Other Fish Species," by Albert C. Smith, article, California Fish and Game, vol. 49, no. 1, January 1963, pp. 44-49, illus., printed, single copy 75 cents. California Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif.

HERRING:

Vitamin A and Fat in the Herring (CLUPEA HARENGUS L.) and in Its Food, by L. R. Fisher and Zena D. Hosking, Marine Research No. 4, 35 pp., illus., printed, 11s. (US\$2.20--includes mailing costs). Sales Section, British Information Services, 845 Third Ave., New York 22, N. Y., 1962.

HONDURAS:

Import Tariff System of Honduras, by Frederick J. Tower, OBR-62-3, 2 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers units of currency, weights, and measures; bases of specific and ad valorem duties; methods of payment of duty; and preferential duties accorded other Central American nations. Also discusses customs surtaxes, sales and other internal taxes, consular documents and fees, trade restrictions, and special regulations.

INTERNATIONAL LAW COMMISSION:

Juridical Regime of Historic Waters, including Historic Bays (Study prepared by the Secretariat),

A/CN.4/143., 74 pp., processed. Secretariat, United Nations, New York, N. Y., March 8, 1962.

IOWA:

Quarterly Report Iowa Cooperative Wildlife and Fisheries Research Units, vol. 28, no. 2, October, November, December 1962, 49 pp., illus., processed, distribution restricted. Iowa State University of Science and Technology, Ames, Iowa. Includes, among others, articles on: "Parasites and Diseases of Fish and Wildlife;" "Factors Affecting Fish Production;" "Stream Biology as Related to Fish Production--Des Moines River;" "Effect of Some Physiological and Physical Factors on Blood Lactic Acid Concentration of Channel Catfish;" and "Dynamics of Fish Populations in Natural Lakes--Clear Lake."

IRISH MOSS:

"They Rake Money from the Sea!" article, Fish Boat, vol. 7, April 1962, pp. 26-27, printed, H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.

ISLAMIC REPUBLIC OF MAURITANIA:

Investment Law in the Islamic Republic of Mauritania, OBR-62-25, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the investment code of the Islamic Republic of Mauritania, and background and related information of use to possible United States investors.

JAPAN:

Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 25, November 1962, 66 pp., illus., printed in Japanese with English abstracts. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Includes the following articles: "Studies on the Early Life History of Herring, *Clupea pallasii*, 2--On the Growth and Survival of Larvae in Akkeshi Bay, Hokkaido," by A. Iizuka and others; "On the Locomotion of the Squids, *Ommastrephes sloani pacificus* (Steenstrup), in the Okhotsk Sea along the Coast of Hokkaido during the Autumn of 1961," by H. Araya and S. Kawasaki; "On the Gill-Net Mesh Selectivity Curve," by T. Ishida; "A Study on a Process for Abating Harm Inflicted by Sulphite Pulp Waste upon Aquatic Products," by H. Igarashi and A. Iida; and "Report on Dissolved Nutrients Investigations in the North Pacific and the Bering Sea During June-August 1960," by K. Miwa.

"The Oil Industry of Japan," by Toshimi Akiya, article, Journal of the American Oil Chemists' Society, vol. 39, April 1962, p. 4, printed, American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

Statistic Tables of Fishing Vessels (as of the End of 1961), General Report No. 14, 208 pp., illus., printed in Japanese and English. Japanese Fisheries Agency, Tokyo, Japan. An annual report containing statistical data in detail on the various types of Japanese fishing craft, both powered and nonpowered, as obtained by a fishery registration system. The trend toward motorization of nonpowered craft is noted in this report.

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LIPIDS:

"Extraction of Lipids from Oxidizing Mullet," by Marelynn W. Zipser, Jacqueline Dupont, and Betty M. Watts, article, Journal of Food Science, vol. 27, March-April 1962, pp. 135-138. Journal of Food Science, Department of Food and Nutrition, Florida State University, Tallahassee, Fla.

"Lipids of Salmonoid Fishes. I--Acetone-Soluble Lipid from Liver of Salmon, Oncorhynchus masou (Masu)," by Mutsuo Hatano, Koichi Zama, and Hisanao Igarashi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, November 1961, pp. 1001-1004, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

MUSSELS:

"Tennessee's Mussel Industry," article, The Tennessee Conservationist, vol. XXIX, no. 1, January 1963, pp. 12, 15, illus., printed. The Tennessee Conservationist, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville, Tenn.

NICARAGUA:

Investment in Nicaragua, by Richard P. Rice, OBR-62-14, 12 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses Nicaragua's economic growth, the Government's effort to create conditions favorable to private investment, investment and management, incentive legislation, and taxation. A section on the fisheries outlines a new basic law, promulgated under a decree effective March 6, 1961, designed to regulate the fishing industry. Also covers requirements for fishing licenses and taxation on fishery enterprises.

NYASALAND:

Annual Report of the Department of Game, Fish and Tsetse Control for the Year Ended 31st December 1961, 28 pp., printed, 4s. (about 56 U. S. cents). Government Printer, Zomba, Nyasaland, 1962. The section on fisheries discusses the state of the fish stocks, large-scale licensed fishing enterprises, small-scale unlicensed enterprises, trade in fishery products, and developmental work. Also covers fishery training and public relations, gear and technological research, work of the Joint Fishery Research Organization, trout fishing, fish farming, and other projects. Also includes tables showing landings by gear, by fish genus, and by time of day, in the fresh-water fishery.

OCEANOGRAPHY:

Horizontal Diffusion from an Instantaneous Point-Source Due to Oceanic Turbulence, by Akiro Okubo, Technical Report 32, 125 pp., illus., processed. Chesapeake Bay Institute, The Johns Hopkins University, Baltimore 18, Md., December 1962.

A Review of Theoretical Models of Turbulent Diffusion in the Sea, by Akiro Okubo, Technical Report 30, 112 pp., illus., processed. Chesapeake Bay Institute, The Johns Hopkins University, Baltimore 18, Md., September 1962.

Seas, Maps, and Men (An Atlas-History of Man's Exploration of the Oceans), edited by G.E.R. Deacon, 297 pp., illus., printed, \$9.95 Doubleday & Company, Inc., Garden City, N. Y., 1962. A beautifully-illustrated book, in both color and black-and-white, featuring relief maps, photographs, and reproductions of paintings, drawings, and other art forms. The introduction discusses the earth and its oceans, giving basic geological and geographical information. Then follows a chapter on men against the sea, and the lives of some of the world's great explorers, from Pytheas to the men of the Nautilus. The next section--life in the sea--covers creatures of the sea, the discovery of plankton, the movement of fishes, the great chain of life, and marine biology as a science. Other chapters present some fascinating information on sunken cities and forgotten wrecks, and facts about the sea. In the preface, the authors point out: "Man's exploration of the oceans began long before recorded history. Curiosity must have been one of the motives but the main inducements were the search for food and wealth. During the fifteenth and sixteenth centuries the search for trade routes to the East and the discovery of new lands were the main driving forces. Soon after James Cook's famous voyages in the late eighteenth century most of the great geographical puzzles of the oceans had been solved. In the following century oceanography was to receive its greatest stimulus from science, which sponsored expeditions like the three-year voyage around the world of the research ship H.M.S. Challenger. Today the scientific exploration of the oceans is being carried out by many nations. Like the earlier explorers, the scientist-explorers of the twentieth century continue to search the sea for food, but in addition they are looking for ways to tap the vast mineral wealth and to harness the energy locked up in the oceans; but perhaps more important are the basic studies that are refining our knowledge of the great chain of life in the seas, the currents, the action of waves and tides, and geological and geophysical aspects of the sea floor." This is an excellent textbook for schools, probably at the high school level, and would certainly be a worthwhile addition to any home library.

Underwater Acoustics, edited by V. M. Albers, 354 pp., illus., printed, \$12.50. Plenum Press, 227 W. 17th St., New York 11, N. Y., 1963.

OREGON:

Surface Temperature and Salinity Observations at Shore Stations on the Oregon Coast for 1961, by Malcolm Oliphant, Bruce Wyatt, and Norman F. Kujala, Data Report No. 8, 20 pp., illus., processed. Department of Oceanography, School of Science, Oregon State University, Corvallis, Oreg., September 1962.

OYSTERS:

"Chromate Color Test for Estimating Age-Temperature History of Raw Shucked Oysters," by M. L. Schafer, J. E. Campbell, and K. H. Lewis (U. S. Department of Health, Education, and Welfare, Cincinnati, Ohio), article, Journal of Agriculture and Food Chemistry, vol. 10, May-June 1962, pp. 261-267, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

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"Effect of Pesticides on Oysters," by Philip A. Butler, Alfred J. Wilson, and Alan J. Rick (U. S. Bureau of Commercial Fisheries, Gulf Breeze, Fla.), article, Chemical Abstracts, vol. 57, August 20, 1962, 5140a, printed, The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

PACIFIC OCEAN:

The Distribution of Pacific Euphausiids, by Edward Brinton, 219 pp., illus., printed, \$5. University of California Press, Berkeley 4, Calif., 1963.

PEARLING:

Australian Pearling Industry Statistical Handbook, 49 pp., illus., processed, Fisheries Division, Department of Primary Industry, Canberra, Australia, August 1962. Recent trends of the Australian pearling industry are shown by the statistics presented in this handbook. Contains data on quantity and value of pearl and trochus shell production, Japanese pearling operations in Australian waters, and exports of marine shells. Most data are for 1961, with some information for the period 1901-1961.

PENNSYLVANIA:

Engineering and Biological Study of Proposed Fish-Passage at Dams on Susquehanna River, Pennsylvania, by Milo C. Bell and Harlan B. Holmes, 137 pp., plus 49 figs. and 64 plates, processed, Pennsylvania Fish Commission, Harrisburg, Pa., December 1962. Reports on an engineering and biological study of the problems of fish passage at Conowingo and Safe Harbor Dams on the Susquehanna River.

PHILIPPINES:

Licensing and Exchange Controls in the Philippines, by Kenneth A. Guenther, OBR-62-2, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Controls on imports into the Philippines that had been in effect since 1949 were lifted by Presidential proclamation of January 21, 1962. All import transactions now take place at the freely fluctuating exchange rate. This report covers Philippine import and export controls, United States import and export controls, and other related information.

PHYSIOLOGY:

*Rukovodstvo po Metodike Issledovanii Fiziologii Ryb; Sbornik Statei (Handbook of Research Methods on Physiology of Fish; Collected Articles), R 24469, printed in Russian. Akademiia Nauk SSSR, Ikhtiologicheskaya Komissia, 1962.

POULTRY NUTRITION:

"Studies on the Soy and Fish Solubles Growth Factors for Chicks," by W. W. Westerfeld and A. C. Hermans, article, Journal of Nutrition, vol. 76, April 1962, pp. 503-511, printed, American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

POULTRY RATIONS:

"Fish Byproducts, Poultry Byproducts Meal, and Methionine Hydroxy Analogue as Variables in Broiler Rations," by Elbert J. Day, Ben C. Dilworth, and James E. Hill, article, Poultry Science, vol. 41, July

1962, pp. 1261-1267, printed, Poultry Science Association, Ohio State University, Columbus 10, Ohio.

"Seaweed Meal in Feed for Chicks and Laying Hens," by A. Mehner, K.W. Stute, and U. Torges (Bundesforschungsanstalt Kleintierzucht, Celle, Germany), article, Chemical Abstracts, vol. 56, April 30, 1962, 10651g, printed, The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

PROTEIN:

"Products of Protein Hydrolysis from Fish," by D. P. Sen and N. L. Lahiry (Central Food Technological Research Institute, Mysore, India), article, Chemical Abstracts, vol. 56, June 11, 1962, 14676c, printed, The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Studies on the External Mucous Substance of Fishes. IV--Amino Acid Composition of the Protein of the External Mucous Substance from Some Fishes," by Noriyuki Enomoto, Tokio Izumi, and Yukio Tomiyasu, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, June 1961, pp. 606-608, printed, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

QUALITY:

"Effect of Subfreezing on Fish Quality," by N. A. Golovkin and L. I. Persina, article, Kholodil'naiia Tekhnika, no. 1, 1961, pp. 35-38, printed, Four Continent Book Corporation, 156 5th Ave., New York 10, N. Y.

RADIATION:

"Radiation-Pasteurized Shrimp and Crabmeat," by Dorothy J. Scholz and others, article, Food Technology, vol. 16, July 1962, pp. 118-120, printed, The Garrard Press, 510 N. Hickory, Champaign, Ill.

RADIOACTIVE CONTAMINANTS:

A Study of the Movement and Diffusion of an Introduced Contaminant in New York Harbor Waters, by D. W. Pritchard, Akio Okubo, and Emanuel Mehr, Technical Report 31, 95 pp., illus., processed, Chesapeake Bay Institute, The Johns Hopkins University, Baltimore 18, Md., October 1962.

RADIOACTIVE ISOTOPES:

*Ispol'zovanie Radioaktivnykh Izotopov v Rybnom Khoziaistvu (Use of Radioactive Isotopes in the Fishing Industry), by G. S. Karzinkin, R 25325, printed in Russian, 1962.

RAINBOW TROUT:

"Changes in Glycogen, Pyruvate and Lactate in Rainbow Trout (Salmo gairdneri) during and following Muscular Activity," by Edgar C. Black and others, article, Journal of the Fisheries Research Board of Canada, vol. 19, May 1962, pp. 409-436, printed, Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Diet, Glycogen Reserves and Resistance to Fatigue in Hatchery Rainbow Trout. Part II," by Richard B. Miller and Frances Miller, article, Journal of the Fisheries Research Board of Canada, vol. 19, May 1962, pp. 365-375, printed, Queen's Printer and Controller of Stationery, Ottawa, Canada.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Laboratory Study of the Toxicity of Certain Synthetic Detergents to the Rainbow Trout," by J. Wurtz-Arlet, article, Chemical Abstracts, vol. 57, October 15, 1962, 10374a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

REFRIGERATION:

The Effect of Storage in Refrigerated Sea Water on the Amino Acids and Other Components of Fish (Paper presented at FAO International Conference on Fish in Nutrition, Washington, D. C., September 19-27, 1961), by E.H. Cohen and J.A. Peters, processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961.

RHODESIA AND NYASALAND:

Basic Data on the Economy of The Federation of Rhodesia and Nyasaland, by John F. Handford and Clifford R. Nelson, OBR-62-44, 12 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A section on fishing covers fishery products landings from Lakes Kariba, Mweru, and Nyasa; and assistance to the industry given by the United Nations Special Fund. Discusses geography and climate, population, form of government, structure of the economy, and finance. Also discusses economic development, agriculture, external trade, industry, and other related information.

Import Tariff System of the Federation of Rhodesia and Nyasaland, OBR-62-26, 2 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers currency, weights, and measures; specific and ad valorem duties; and preferential treatment of duties--federal tariff and dumping duties. Also covers method of payment of duty, customs surtaxes and internal taxes, shipping documents and fees, and trade restrictions.

SALMON:

"Composition of Sperm Nuclei in Baltic Salmon," by I. B. Zbarskii and L. P. Ermolaeva (A. N. Severtsov Inst. Animal Morphol., Moscow, U.S.S.R.), article, Chemical Abstracts, vol. 56, January 8, 1962, 793b, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SAUDI ARABIA:

Preparing Shipments to Saudi Arabia, by Roger D. Severance, OBR-62-28, 8 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) A report on the preparation of shipments for export to Saudi Arabia. It covers the preparation of shipping documents, information on labeling and marking, customs procedures, and related subjects.

SEA OTTER:

The Sea Otter, by I. I. Barabash-Nikiforov, V. V. Reshetkin, and N. K. Shidlovskaya, OTS 61-31057, 331 pp., illus., printed, \$2.25. (Translated from the Russian, Kalan, 266 pp., 1947.) Office of Tech-

nical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

SEAWEED:

"Storage of Dried Laver at Low Temperature," by Yasuhiko Tsuchiya, Yoshio Suzuki, and Takashi Sasaki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, October 1961, pp. 919-933, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

SENEGAL REPUBLIC:

Investment Law of the Republic of Senegal, OBR-62-31, 8 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the investment code of the Republic of Senegal, and background and related information of use to possible United States investors.

SHAD:

"Chemical Composition of West African Fish. I--West African Shad from the Sierra Leone River Estuary," by J. C. D. Watts (West African Fisheries Research Institute, Freetown, Sierra Leone), article, Chemical Abstracts, vol. 56, April 30, 1962, 10717b, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SHARK LIVER OIL:

"A New Method for Refining of Shark Liver Oil on Commercial Scale and Recovery of Vitamin A by Partial Saponification," by S. A. Ali and L. Rahman, article, Chemical Abstracts, vol. 55, December 11, 1961, 26363f, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

SHARKS:

"Partitioning of Body Fluids in the Lake Nicaragua Shark and Three Marine Sharks," by Thomas B. Thorson, article, Science, vol. 138, no. 3541, November 9, 1962, pp. 688-690, printed, single copy 35 cents. Science, 1515 Massachusetts Ave., NW., Washington 5, D. C.

SHRIMP:

"Deteriorative Changes in Frozen Shrimp and Their Inhibition," by M. B. F. Chastain, article, Journal of the Science of Food and Agriculture, vol. 12, 1961, p. 11239, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Qualitative Distribution of Free Amino Acids in Different Species of Prawns," by N. K. Velankar and K. Mahadeva Iyer, article, Chemical Abstracts, vol. 56, January 8, 1962, 789b, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Rock Salt Makes Brine for Shrimp Canning," by Ray M. Thompson, article, Canner Packer, vol. 131, August 1962, pp. 32-33, printed. Triad Publishing Co., 59 E. Monroe St., Chicago 3, Ill.

SMALL BUSINESS MANAGEMENT:

Financing Export Sales, by Clarence J. Ruethling, Management Aids for Small Manufacturers No. 149, 4 pp., processed. Small Business Administration,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Washington 25, D. C., February 1963. A report describing steps to be taken by businessmen in financing export sales. Discusses five specific types of information needed by the seller in such transactions: (1) financial responsibility and moral reputation of his overseas buyer; (2) availability of dollars in the country of purchase; (3) documentation and protection required to effect shipment; (4) various means of getting and guaranteeing payment, and (5) financial help which is available to exporters.

Small Manufacturers and the Financial Gap, by James F. Mahar and Dean C. Coddington, Management Research Summary, 2 pp., processed, Small Business Administration, Washington 25, D. C., 1963. A summary of a report on the fund-raising ability of small firms during formation and early growth. Often long-term funds are not available when their need is most critical. Part of this "financial gap" is due to lack of knowledge about sources of funds. Better understanding of the criteria used by various financial institutions could save time both for owner-managers of small firms and for the institutions.

Tax Dates for Small Marketers, Small Marketers Aid No. 87, printed, Small Business Administration, Washington 25, D. C. Prepared mainly for small businessmen who have to fill out their own tax forms. Lists the kinds of Federal taxes and their due dates. Points out that a review of the tax calendar can be helpful in financial planning. The Internal Revenue Service requires that statements from businessmen on various tax forms be supported by permanent records. This leaflet suggests: "Why not, if you aren't already doing it, coordinate your recordkeeping with the various tax dates? For example, if your business year ends at a date which means extra work in gathering tax information, you may want to re-vamp your system so that your regular records will give you the proper tax information."

Tax Dates for Small Plants, Management Aid for Small Manufacturers No. 148., 8 pp., processed, Small Business Administration, Washington 25, D. C., January 1963. A leaflet giving dates important to small businessmen in the payment of Federal taxes. Contains a 1963 tax calendar, information for fiscal year taxpayers, and a list of general and special tax forms. Also includes a calendar for state and local taxes to be filled in by the individual. Stresses that the Internal Revenue Service requires that all of the taxpayer's statements on tax forms be supported by permanent records.

Wholesalers' Services to Food Retailers, by Russell L. Childress and R. Dean Shippy, Management Research Summary, 2 pp., processed, Small Business Administration, Washington 25, D. C., 1963. A summary of a report on food retailers' evaluation of wholesalers' services. In the study conducted in connection with the report, it was found that retailers' ideas varied about what their wholesalers could do to improve their services. However, the following were among those expressed most often: (1) expansion of the produce-procurement services; (2) more help from the meat and produce specialists; (3) better store-planning programs; and (4) supplying a management-training program.

SMOKING:

The Preservation of Fish by Smoke-Curing in the Torry Kiln, by J. C. D. Watts, Fisheries Department Technical Paper No. 2, 8 pp., printed, 1s. (about 14 U. S. cents). Government Bookshop, Water St., Freetown, Sierra Leone, 1962.

SPERM OIL:

"Sperm Whale Oil," by Pablo Kovacs (Derma S.R.L., Buenos Aires, Argentina), article, Chemical Abstracts, vol. 56, January 22, 1962, I544d, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Utilization of Sperm Oil. IV--Fatty Alcohol Compositions of Glyceride Fraction and Wax Fraction Separated from Sperm Oil by the Urea-Adduct Method," by Shoichiro Watanabe and Yoshiro Abe (Keio Kijuku Univ., Tokyo, Japan), article, Chemical Abstracts, vol. 55, March 20, 1961, 5995a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

STERN TRAWLERS:

"Stern Trawling Systems--A World Fishing Survey;" "British Trawl Winch Design in 1962," by H. S. Noel; "Operating Experience of Second Dutch Stern Trawler," articles, World Fishing, vol. 12, no. 1, January 1963, pp. 50-57, illus., printed, single copy 3s. (about 42 U. S. cents). World Fishing, John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England. Compares the designs of various stern trawlers and outlines their operations. Among the many advantages of this type of vessel are improved working conditions for the crew and less damage to the catch.

STORAGE OF FISH IN SEA WATER:

"Cooling and Keeping of Fish and Small Shrimps in Sea Water," by L. Van Pel, article, De Visserijwereld, vol. 20, 1961, pp. 27-29, printed in Dutch, N. V. Drukkerij Trio, 27 Nobelstraat, The Hague, Netherlands.

TAIWAN:

Common Food Fishes of Taiwan, by Yun-sheng Liang, Po-wei Yuan, and Hung-chia Yang, 96 pp., illus., printed, Chinese-American Commission on Rural Reconstruction, Taipei, Taiwan, China, December 1962. Gives names of food fish of Taiwan in Chinese and English, their scientific names, a brief description of each species, information as to where and when they are available, and their market price. Describes, with illustrations, 51 species of fish and 14 species of other aquatic animals.

THAILAND:

Investment Factors in Thailand, 1962, by William H. Riley, WTIS Part 1, Economic Report No. 62-82, 16 pp., illus., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A handbook of valuable information for the prospective investor in Thailand. At the close of 1961, United States private investment, the largest share of total foreign investment in Thailand, was estimated at \$27 million. This report covers present U. S. private investment, Gov-

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ernment policy, entry of U.S. private capital, and controls on capital. It also discusses investment negotiation, taxation of foreign investment, manufacturing, and business data. Included are several photos and maps.

THAWING:

"Dielectric Thawing of Fish. I--Experiments with Frozen Herrings," by A. C. Jason and H. R. Sanders, article, *Food Technology*, vol. 16, June 1962, pp. 101-106, printed, The Garrard Press, 510 N. Hickory, Champaign, Ill.

TRADE LISTS:

The Bureau of International Business Operations, U.S. Department of Commerce, has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of Foreign Commerce, U.S. Department of Commerce, Washington 25, D. C., or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Spain, 48 pp. (October 1962). Lists the names and addresses, size of firms, and types of products handled by each firm. Includes producers and exporters of canned and frozen fish and shellfish. Also contains trade and industry data (including fishery products).

Oils (Animal, Fish and Vegetable)--Importers, Producers, Refiners and Exporters--Republic of South Africa, 25 pp., November 1962. Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish and whale oils, and shark liver oil.

TROUT:

"Trout Show Susceptibility to Cancer-Producing Agents," article, *New Scientist*, vol. 15, no. 306, September 27, 1962, p. 662, printed, New Scientist, Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

TUNA:

"The Schooling Behavior of Pacific Yellowfin and Skipjack Tuna Held in a Bait Well," by James Joseph and Izadore Barrett, article, *California Fish and Game*, vol. 49, no. 1, January 1963, p. 55, printed, single copy 75 cents. California Fish and Game, Printing Division, Documents Division, Sacramento 14, Calif.

UGANDA:

Uganda, Report for the Year 1961, 73 pp., illus., printed, Information Department, Government of Uganda, Entebbe, Uganda, 1962. Includes a small section on the fisheries of Lakes Albert and Victoria, and the Nile River.

U.S.S.R.:

*Biologiya Oзера Baikal (Biology of the Lake Baikal), by M. M. Kozhov, R 24470, printed in Russian, 1962.

*Rybi Basseina R. Usy i Ikh Kormovye Resursy (Fish of the Usa River Basin and Their Food Resources), R 24537, printed in Russian, Akademiia Nauk SSSR, Komi Filial, 1962.

Rybnoe Khoziaistvo, vol. 38, no. 6, June 1962, 88 pp., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavnioproekta, pri Gosplanie SSSR, Moscow, U.S.S.R. Includes, among others, these articles: "Complex Mechanization and Automation is the Principal Step Towards the Development of the Fishing Industry," "Yearly Plan Accomplished in Four Months," "Resources of the World Oceanic Fishery," by G. V. Martinsen; "South-Atlantic Sardine," by S. M. Overko; "The Problem of Young Pink Salmon and Dolly Varden Char (*Salvelinus malma*) Migrating Downstream in the Rivers of Sakhalin," by M. Ia. Kazarnovskii; "Perfecting Maiakovskii Class Trawler Design during Construction," by V. M. Ivanov; "Industrial Equipment Needs of Stern Trawlers," by G. A. Traubenberg and others; "The Trawling Speed," by I. R. Matrosoy; "The Work of Fishermen Assigned to Trawler Kureika," by O. Krotova and V. Chaikin; "Exploratory Activities in the Area of Newfoundland," by B. E. Karasev; "Mechanized Lines in the Pre-processing of Salted Herring," by L. Rozin; "The Production of Special Canned and Salted Herring on Refrigerator Ships of the RR Class," by L. G. Visk; "New Saury-Cutting Machine," by V. E. Sakharov; "Fish Processing, a Profitable Branch in Kolkhoz Economics," by N. N. Kravtsov; "New Soviet-Japanese Agreement," "Flying Fishes," "Conference of Personnel Working for the Fishing Industry in the Azov-Black Sea Area," "Conference of Personnel Working for the Fishing Industry in the Caspian Sea Region," and "Seminar on Pond Fishery."

--Titles translated by Milan A. Kravanja

Rybnoe Khoziaistvo, vol. 38, no. 7, July 1962, 91 pp., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavnioproekta, pri Gosplanie SSSR, Moscow, U.S.S.R. Includes, among others, these articles: "Measures for Increasing the Catch of Fish and Output of Fishery Products," "Fishery Resources of the Seas and Oceans Must be Better Exploited!," "Fluctuations of Atlantic and Scandinavian Herring Populations," by S. S. Federov; "Commercial Fishery for Baltic Herring in the Gulf of Finland," by A. F. Bondarenko; "New Commercial Fishery Resources," "Basic Problems in Construction of Automated Trawler," by G. B. Terent'ev and L. A. Ganf; "New Methods of Trawling for Far Eastern Ocean Perch," by A. V. Lestev; "A Review of the Work of Large Refrigerated Trawler (BMRT) Saltykov-Shchedrin," by B. Chervov; "How to Insure the Safety of Vessels during Fishing Operations," by A. M. Koniaev; "The Refrigeration Mechanic's Shipboard Laboratory," by B. V. Golubev; "Fish-Breeding Machine," by V. T. Sakharov; "Cooler for Fried Fish and other Food Products," by M. Fikh; "Changes in Weight of Salmon during Salting," by E. A. Nasedkina; "Vitamin Content in Fish and Whale Flour," by V. I. Treshcheva; "The Work of the Bulgarian Trout Farm 'Samokov'," by N. E. Sal'nikov; and "New Era in the Development of Soviet-Norwegian Fishery Relations," by A. A. Volkov.

--Titles translated by Milan A. Kravanja

*Sovetskie Rybokhoziaistvennye Issledovaniia v Severo-Zapadnoi Chasti Atlanticheskogo Okeana (Soviet Fishery Research in the Northwestern Atlantic), R 25409, printed in Russian. Poliarnii Nauchno-Issledovatel'skii Institut Morskogo Khoziaistva i Okeanografii (PINRO), 1962.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

WEST AFRICA:

Import Tariff System of the Entente States (Ivory Coast, Dahomey, Niger, and Upper Volta), OBR-62-11, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) In 1959, as autonomous members of the French Community, the four territories established a political association known as the Council of the Entente. Since gaining political independence in 1960 the member states have maintained generally coordinated economic and social policies, and have associated with Senegal, Mali, and Mauritania to form the West African Customs Union. This report covers units of currency, weights, and measures; bases of specific and ad valorem duties; methods of payment of duty; and basic and preferential duties. Also discusses the customs surtaxes of member countries, their sales and other internal taxes, shipping documents and fees, trade restrictions, and other special regulations.

WHALING:

"International Quota Agreements," article, Norsk Hvalfangst-Tidende, vol. 51, no. 12, December 1962, pp. 461-466, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway. Summarizes the background and details of a new whaling agreement acceded to by Japan, Netherlands, U.S.S.R., Norway, and the United Kingdom. The agreement was signed at London, June 6, 1962, but must be ratified by all member governments before becoming fully effective. Provides for the distribution, among themselves by percentages, of the total annual catch of Antarctic whales by the signatory nations.

"International Whaling Commission (Chairman's Report of the Fourteenth Meeting)," by C. R. Clark, article, Norsk Hvalfangst-Tidende, vol. 51, no. 12, December 1962, pp. 466-473, printed. Hvalfangerforeningen, Sandefjord, Norway. Comprises the Chairman's Report from the 14th Meeting of the In-

ternational Whaling Commission, held at London, July 2-6, 1962. Reports on condition of the stocks, Antarctic catch limitation, blue whale unit catch limit, opening of the baleen whaling season, blue whale and humpback whale protection, minimum length for sperm whales, North Pacific whale stocks, and related topics.

International Whaling Statistics, no. XLIX, 80 pp., printed, Kr. 2.00 (about 28 U.S. cents). The Committee for Whaling Statistics, Oslo, Norway, 1963. A report on the results of the whaling operations in the Antarctic during the season 1960/1961 and on grounds outside the Antarctic in the calendar year 1961. Includes statistical tables on whaling in the Antarctic; whaling operations of Norway, the United Kingdom, Japan, and the U.S.S.R.; whaling results for various other countries; average size of whales caught; and whales caught by species, sex, and size. Also includes data on average production of oil per "blue-whale equivalent;" and average production of oil per sperm-whale.

"Whaling Operations in the Antarctic in the Season 1961/62," article, Norsk Hvalfangst-Tidende (Norwegian Whaling Gazette), vol. 51, no. 9, September 1962, pp. 347-364, 367-368, 370-373, printed in Norwegian and English. Norsk Hvalfangst-Tidende, Hvalfangerforeningen, Sandefjord, Norway. A survey of the whaling operations in the Antarctic in the season 1961/62 prepared for and submitted at the meeting of the International Whaling Commission in London in June 1962. Covers the most important regulations of the Convention for that season, factoryships and catching boats operated by the countries subscribing to the Convention, and duration of the whaling season. Also discusses the catch by species in the various areas, the catch results in relation to the vessels engaged in whaling and catching time spent, oil production per blue-whale unit, average size of the whales landed, sexually mature and immature whales, and ratio of blue and fin whales in the catch. Includes a number of statistical tables on those topics.



SYNTHETIC DIET FAILS ON CATFISH

In 1962, trials at the Southeastern Fish Cultural Laboratory, U. S. Bureau of Sport Fisheries and Wildlife, control groups of channel catfish fed the synthetic ration successfully used in nutritional-requirement experiments on trout and salmon failed to grow. It is postulated that either channel catfish cannot use one or more of the 18 crystalline amino acids composing the protein complement of the diet or this species may require some nutritional element additional to those needed by salmonoids. (Good growth was previously exhibited by channel catfish on a diet in which casein was the protein source.) The addition of hydroxyproline to the salmonid test diet will be tried to see if this amino acid is essential for channel catfish growth.

REVELER'S SALMON DELIGHT



2 pounds salmon steaks or other fish steaks,
fresh or frozen
 $\frac{1}{4}$ cup melted fat or oil
2 tablespoons lemon juice

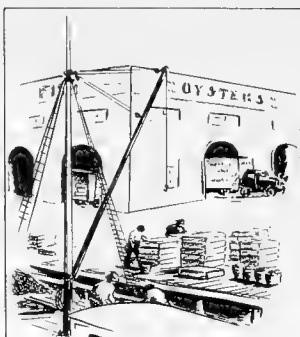
2 tablespoons anchovy paste
1 tablespoon chopped parsley
Dash pepper
Paprika

Thaw frozen steaks. Cut into serving-size portions. Combine remaining ingredients except paprika; mix thoroughly. Place fish on a well-greased broiler pan. Brush with sauce. Broil about 3 inches from source of heat for 5 minutes. Turn carefully and brush other side with sauce. Broil 4 to 5 minutes longer, basting once, until fish is lightly browned and flakes easily when tested with a fork. Sprinkle with paprika. Serves 6.

--From Fisheries Marketing Bulletin: "Let the Sparkle of Mardi Gras--
Linger on Your Table Throughout the Lenten Season."
Issued by the National Marketing Services Office,
U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.



INCREASED INCOME



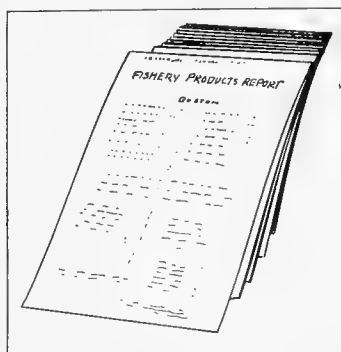
EFFECTIVE DISTRIBUTION



INCREASED CONSUMPTION



IMPROVED PURCHASING



CURRENT SUPPLY AND PRICE DATA



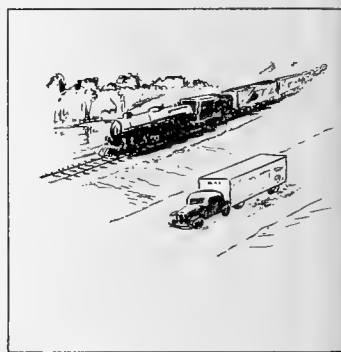
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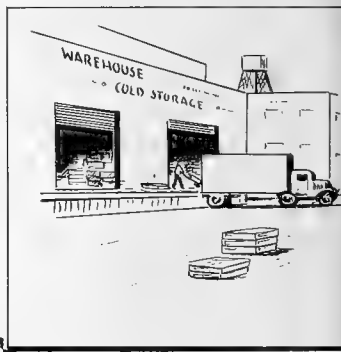
MORE EFFICIENT RESEARCH

FISHERY MARKET NEWS

MAKES POSSIBLE —



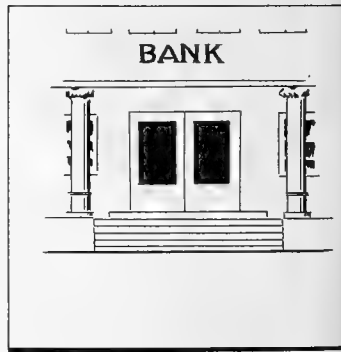
SPEEDIER DELIVERY



STABILIZED SUPPLIES



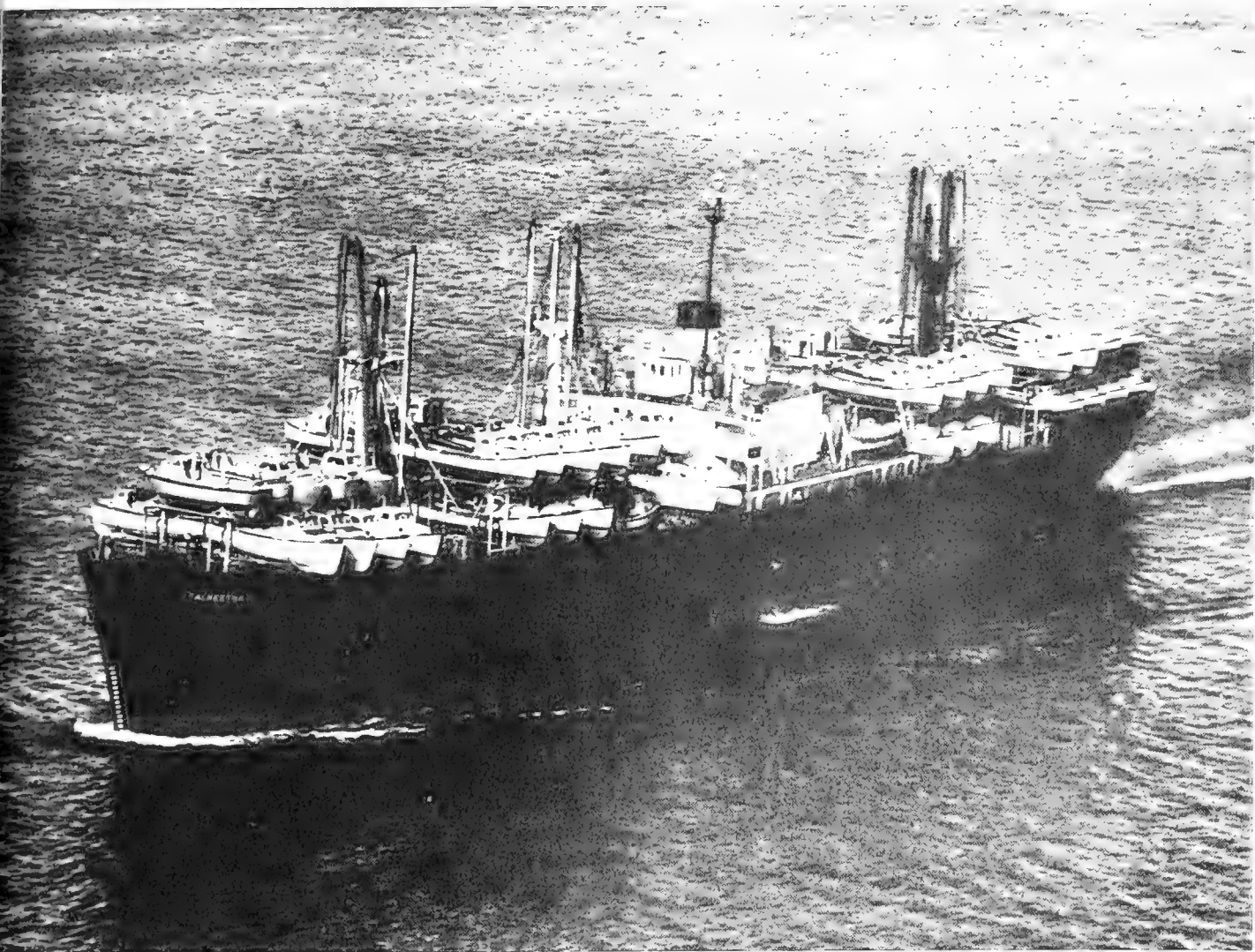
INCREASED FOREIGN TRADE



SAFER LOANS

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Fishes

COMMERCIAL FISHERIES REVIEW



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UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor*

G. A. Albano,** H. M. Bearse, and H. Beasley, Assistant Editors

(*On special assignment for 7 months. **Acting Editor)

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington 5, D.C.

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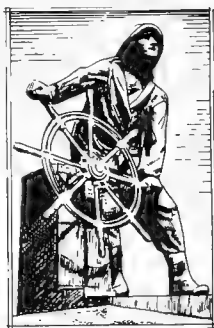
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Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

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* * * * *

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COMPARISON OF SALMON CATCHES IN MONOFILAMENT AND MULTIFILAMENT GILL NETS

By Herbert A. Larkins*

ABSTRACT

An experiment designed to compare the salmon catches of monofilament and multifilament gill nets was conducted in 1962 by the U. S. Bureau of Commercial Fisheries on board the research vessel *Bertha Ann*. Monofilament gill nets of $3\frac{1}{4}$ -inch and $4\frac{1}{2}$ -inch mesh were inserted in the normal multifilament net string and the catches of the two types were analysed in terms of number of fish, length, age, and species composition. The effect of monofilament nets on adjacent multifilament nets was also tested.

In general, the monofilament greatly outfished the multifilament and took the same lengths and ages of salmon as the multifilament although the species composition differed. The presence of monofilament apparently reduced the salmon catch of adjacent $3\frac{1}{4}$ -inch multifilament nets.

INTRODUCTION

Since the beginning of the commercial use of monofilament nets in the North Pacific Ocean during the late 1950's, the popular fisheries news media have reported the apparent superiority of the clear, almost transparent filament over the conventional multifilament nylon twine (*Pacific Fisherman*, Sept. 1961, p. 29). The efficiency of the monofilament gill nets appeared so great that the states of Oregon, Washington, Alaska, and the Province of British Columbia have prohibited their use in the coastal salmon fisheries. The Japanese, who pioneered the use of monofilament in the North Pacific Ocean, are increasing the use of it in their high seas salmon fishery with considerable success (*Pacific Fisherman*, Sept. 1961, p. 62 and Nov. 1961, p. 14).

The Bureau of Commercial Fisheries, under the auspices of the International North Pacific Fisheries Commission, has since 1955, been conducting a continuing high seas salmon research program. One phase of this program has been a surface gill net sampling project in the North Pacific Ocean, Bering Sea, and Gulf of Alaska. To provide sufficient numbers of red (*Oncorhynchus nerka*), chum (*O. keta*), and pink (*O. gorbuscha*) salmon for meristic and scale studies, the amount of nylon multifilament gear used per set has been increased from 600 fathoms in 1955 to 2,000 fathoms in 1960 and 1961.

Because of the length of the present net string (two nautical miles), the

*Fishery Biologist (Research), Biological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.



Fig. 1 - The Bureau of Commercial Fisheries chartered research vessel M/V *Bertha Ann*.

cost of providing the nets and spares for a single string, plus the expense of handling and maintenance, has become great. Loss of gear due to bad weather, whales, shipping, etc., has also increased with the longer string.

Therefore, the promise of a more efficient type of sampling gear, the monofilament gill net, was welcomed in that it could possibly provide the necessary numbers of salmon with a saving of time, effort, and money through use of a shorter net string.

In view of the continuing aspects of our research work and the need for data that is comparable from year to year, a careful evaluation of the monofilament netting was necessary before it could be incorporated into our sampling scheme.

During the 1962 field season, monofilament gill nets were included in the net string of the Bureau's chartered research vessel M/V Bertha Ann (fig. 1). An experiment was designed to investigate the selective properties of monofilament nets in terms of age composition, species composition, and length composition of its catches as well as the comparative efficiency of monofilament in taking salmon. Furthermore, the design permitted an analysis of the effect the presence of monofilament nets might have on adjacent multifilament nets.

In general, the objective of this study was to determine if monofilament gill nets would take consistently larger samples than multifilament nets with resulting reduction in cost, time, and effort in handling and maintaining the net string.

METHODS AND MATERIALS

DESCRIPTION OF NETS: The multifilament nets, used exclusively in the past, were made of type 330 nylon. The mesh sizes (stretched measure) used in 1962 were $2\frac{1}{2}$ -, $3\frac{1}{4}$ -, $4\frac{1}{2}$ -, and $5\frac{1}{4}$ -inch. The webbing, dyed green, was hung in 50 percent on the cork and lead lines (100 fathoms of web hung on 50 fathoms of cork and lead line) and was four fathoms deep. The individual nets were tied together at the cork and lead lines and the webbing of adjacent nets was laced together to form a continuous string. See Powell and Peterson (1957) and Hanavan and Tanonaka (1959) for a complete description of high seas salmon gill nets.

The monofilament netting was of German-manufactured Perlon. The experimental nets used in 1962 were of $3\frac{1}{4}$ - and $4\frac{1}{2}$ -inch mesh size. The filament in the $3\frac{1}{4}$ - and $4\frac{1}{2}$ -inch mesh size nets was 0.5 and 0.6 mm. in diameter, respectively. The monofilament nets were dyed a very light blue-grey and hung identically with the multifilament nets.

DESCRIPTION OF NET STRING: During May and June (spring season), the net string was composed of twenty-six $4\frac{1}{2}$ -inch multifilament, eight $5\frac{1}{4}$ -inch multifilament, and two $4\frac{1}{2}$ -inch monofilament nets. The net sequence was: $4\frac{1}{2}$ "- $4\frac{1}{2}$ "- $5\frac{1}{4}$ " repeated eight times, followed by twelve $4\frac{1}{2}$ -inch nets. The two $4\frac{1}{2}$ -inch monofilament nets were inserted in positions 5 and 23 of the string.

In July, August, and September (summer season), the string was composed of the following nets:

Number	Mesh Size (Inches)	Type
4	$2\frac{1}{2}$	Multifilament
7 or 8	$3\frac{1}{4}$	"
15 or 16	$4\frac{1}{2}$	"
4	$5\frac{1}{4}$	"
1 or 2	$3\frac{1}{4}$	Monofilament
1 or 2	$4\frac{1}{2}$	"

The string was designed to allow the use of a basic portion of multifilament nets to collect data comparable with past years with additional control and experimental portions at the distal end of the string. The basic portion of 24 multifilament nets and the control section of 4 multifilament nets were joined together in 1 continuous string with the experimental portion

separated from it by a 5-fathom line (figure 2). The length of the experimental portion was either 4 or 8 nets depending on the weather and expected catch. The control portion consisted of multifilament nets only, of the same mesh size and in the same order as the experimental section to provide a basis of comparison where the presence of monofilament nets in the experimental portion was the only variable.

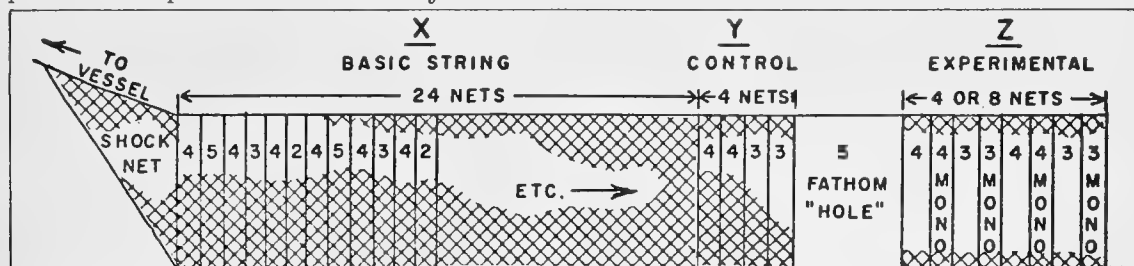


Fig. 2 - Gear makeup for *Bertha Ann* summer cruise, 1962.

FISHING ROUTINE: The complete net string (32 or 36 nets) was attached, by a 50-fathom line, to a heavy, triangular shock net made of purse-seine web. The shock net acted to absorb some of the strain of vessel surge against the gear and helped prevent the nets from rolling up due to vessel action. The shock net was then connected, through a swivel, to about 100 fathoms of heavy (1-inch nylon) riding line to the vessel.

The normal fishing routine was to set the net string at dusk in the evening, allow it to fish through the night, then haul it aboard early in the morning after sunrise. Setting time was about 45 minutes; hauling time averaged about 3 hours, depending on the size of the catch and weather conditions. Normally, the vessel remained moored to the string during the night but on occasion, when the weather became bad, the string was cast loose with lighted flag poles, radio buoys, or radar reflectors attached to it.

The nets were repaired daily by mending or when necessary, by replacement. However, through the season as the nets became worn and damaged, they were probably less efficient. The state of repair of the multifilament and monofilament nets is believed to have been equal at any one time.

RESULTS

COMPARISON OF GROSS CATCHES: Table 1 lists the salmon catches of all of the 1962 *Bertha Ann* sets by net type for the $3\frac{1}{4}$ - and $4\frac{1}{2}$ -inch mesh sizes. The catch per net of the multifilament and monofilament types varied widely from set to set but in 74 of the 79 comparisons the monofilament nets outfished the multifilament.

Table 2 gives the catch per effort statistics of the two types of nets averaged over the spring and summer seasons and the year. In all three comparisons the monofilament was at least 2.3 times as effective in catching salmon as was the multifilament. The $4\frac{1}{2}$ -inch monofilament caught 6.5 times as many salmon per net as the multifilament during the spring season. Over the entire year, in both the $3\frac{1}{4}$ - and $4\frac{1}{2}$ -inch mesh sizes, the catch per unit of effort of the monofilament averaged over three times that of the multifilament.

The data presented in table 2 indicates that the monofilament nets were more efficient than the multifilament for all three species but the increased efficiency appears to be of a different magnitude for each species. Within both mesh sizes the relative efficiency of the monofilament is highest for chum salmon, intermediate for red salmon, and lowest for pink salmon.

COMPARISON OF LENGTH COMPOSITION: The study of length-frequencies of the two net types is confined to the summer season (sets 20-49) where both $3\frac{1}{4}$ - and $4\frac{1}{2}$ -inch mesh monofilament nets were used and where the catch was primarily immature red and chum salmon of different ocean ages.

Table 1 - Catch and Catch Per Unit of Effort of $\frac{3}{4}$ -Inch and $4\frac{1}{2}$ -Inch Multifilament and Monofilament Nets by Set and Species, 1962

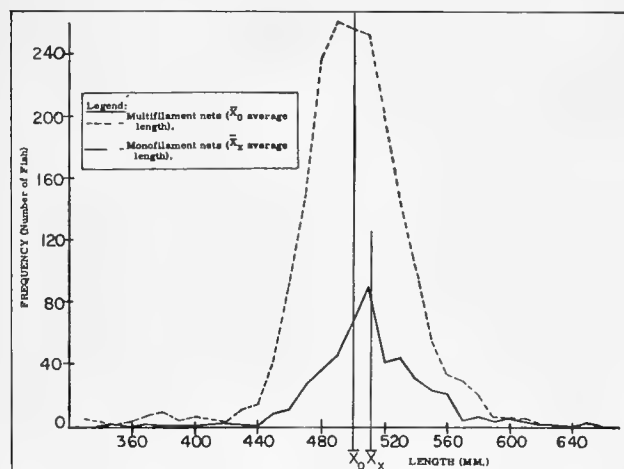
Set Number	Date	3 1/4 - Inch Multifilament						3 1/4 - Inch Monofilament													
		Num-ber Red	Num-ber Chum	Num-ber Pink	Total	Num-ber Nets	Catch Per Net			Total Catch Per Net	Num-ber Red	Num-ber Chum	Num-ber Pink	Total	Num-ber Nets	Catch Per Net			Total Catch Per Net		
							Red	Chum	Pink							Red	Chum	Pink			
1	5/30																				
2	6/1																				
3	6/2																				
4	6/3																				
5	6/4																				
6	6/5																				
7	-																				
8	6/10																				
9	6/11																				
10	6/16																				
11	-																				
12	6/19																				
13	6/20																				
14	6/25																				
15	6/26																				
16	6/27																				
17	6/28																				
18	6/29	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
19	6/30	0	0	0	0	2	2.00	2.00	0	4.00	0	15	0	59	2	22.00	7.50	0	0.50	0	0.50
20	7/2	4	4	0	8	2															
21	7/12	222	45	3	270	8	27.75	5.63	0.38	33.75	136	74	2	212	2	68.00	37.00	1.00	106.00		
22	7/14	121	14	0	135	8	15.13	1.75	0	16.88	68	6	0	74	2	34.00	3.00	0	37.00		
23	7/15	39	18	3	60	8	4.88	2.25	0.38	7.50	13	16	0	29	2	6.50	8.00	0	14.50		
24	7/17	8	4	0	12	8	1.00	0.50	0	1.50	45	5	1	51	2	22.50	2.50	0.50	25.50		
25	7/18	48	4	1	53	8	6.00	0.50	0.13	6.63	94	3	2	99	2	47.00	1.50	1.00	49.50		
26	7/19	86	6	1	93	8	10.75	0.75	0.13	11.63	84	5	1	90	2	42.00	2.50	0.50	45.00		
27	7/21	63	6	1	70	7	9.00	0.86	0.14	10.00	53	2	0	55	1	53.00	2.00	0	55.00		
28	7/22	17	0	0	17	8	2.13	0	0	2.13	54	4	0	58	2	27.00	2.00	0	29.00		
29	7/23	35	2	0	37	8	4.38	0.25	0	4.63	12	2	0	14	2	6.00	1.00	0	7.00		
30	7/24	118	5	0	123	8	14.75	0.63	0	15.38	40	5	0	45	2	20.00	2.50	0	22.50		
31	7/25	96	15	2	113	7	13.87	2.15	0.29	16.16	50	9	0	59	1	50.00	9.00	0	59.00		
32	7/31	55	2	0	57	7	7.87	0.29	0	8.15	19	1	0	20	1	19.00	1.00	0	20.00		
33	8/4	72	2	1	75	8	9.00	0.25	0.13	9.38	44	2	0	46	2	22.00	1.00	0	23.00		
34	8/8	57	7	0	64	8	7.13	0.88	0	8.00	11	0	0	11	2	5.50	0	0	5.50		
35	8/9	51	3	0	54	8	6.38	0.38	0	6.75	55	1	0	56	2	27.50	0.50	0	28.00		
36	8/10	14	3	0	17	7	2.00	0.43	0	2.43	29	1	0	30	1	29.00	1.00	0	30.00		
37	8/11	76	9	0	85	7	10.87	1.29	0	12.16	15	0	0	15	1	15.00	0	0	15.00		
38	8/13	101	4	0	105	7	14.44	0.59	0	15.02	19	0	0	19	1	19.00	0	0	19.00		
39	8/14	74	1	0	75	7	10.58	0.14	0	10.73	18	0	0	18	1	18.00	0	0	18.00		
40	8/15	5	0	0	5	7	0.72	0	0	0.72	0	0	0	0	1	0	0	0	0	0	0
41	8/18	4	1	0	5	7	0.57	0.14	0	0.72	1	0	0	1	1	1.00	0	0	1.00		
42	8/19	2	4	0	6	7	0.29	0.57	0	0.86	4	3	0	7	1	4.00	3.00	0	7.00		
43	8/20	5	0	0	5	7	0.72	0	0	0.72	3	0	0	3	1	3.00	0	0	3.00		
44	8/27	16	20	0	36	8	2.00	2.50	0	4.50	15	14	0	29	2	7.50	7.00	0	14.50		
45	8/28	12	12	0	24	8	1.50	1.50	0	3.00	11	15	0	26	2	5.50	7.50	0	13.00		
46	8/29	13	10	0	23	8	1.63	1.25	0	2.88	5	8	0	13	2	2.50	4.00	0	6.50		
47	8/30	15	13	0	28	8	1.88	1.63	0	3.50	4	7	0	11	2	2.00	3.50	0	5.50		
48	8/31	4	28	0	32	8	0.50	3.50	0	4.00	4	10	0	14	2	2.00	5.00	0	7.00		
49	9/2	3	32	0	35	8	0.38	4.00	0	4.38	1	48	0	49	2	0.50	24.00	0	24.50		

4½-Inch Multifilament										4½-Inch Monofilament																																						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
5/30	6/1	6/2	6/3	6/4	6/5	-	6/10	6/11	6/16	-	6/19	6/20	6/25	6/26	6/27	6/28	6/29	6/30	7/2	7/12	7/14	7/15	7/17	7/18	7/19	7/21	7/22	7/23	7/24	7/25	7/31	8/4	8/8	8/9	8/10	8/11	8/13	8/14	8/15	8/18	8/19	8/20	8/27	8/28	8/29	8/30	8/31	9/2
1	26	10	41	6	26	-	28	49	39	-	19	16	45	24	16	68	0	0	60	252	135	25	47	89	134	37	18	57	155	78	39	124	115	149	70	141	166	66	29	47	15	3	47	23	14	1	3	2
19	60	125	40	27	41	-	27	45	2	-	25	34	19	24	26	103	0	0	80	542	209	28	2	6	129	48	31	74	167	119	43	1	20	12	0	13	22	7	37	5	48	23	70	28	20	9	11	80
4	6	8	44	10	21	-	7	9	1	-	0	12	4	2	1	10	0	0	6	82	18	63	13	34	6	7	1	2	8	37	2	1	1	0	1	0	1	2	0	2	0	1	0	0	0	0	0	14
14	28	11	40	27	41	-	27	45	2	-	6	6	19	24	7	25	0	0	14	208	56	28	2	6	6	4	12	15	4	4	4	9	20	12	13	22	7	7	8	7	33	19	23	5	6	8	64	
0.66	2.31	1.12	4.81	1.66	3.39	-	2.39	3.97	1.62	-	0.96	1.31	2.62	1.93	0.92	3.97	0	0	5.34	38.70	13.94	7.25	3.88	8.06	3.20	1.94	4.63	10.44	7.94	2.87	8.38	11	10.06	0.54	10.94	11.54	4.94	2.47	0.33	3.20	1.53	4.38	1.75	1.25	1.25	0.69	5.00	
0.14	0.23	0.31	1.69	0.38	0.81	-	0.27	0.35	0.04	-	0	0.46	0.15	0.08	0.04	0.38	0	0	0.40	5.85	1.20	3.94	0.81	3.13	0.47	0.06	0.13	0.50	2.47	0.13	0.06	0.06	0	0.07	0	0.07	0.13	0.47	0.53	0.47	2.20	1.27	1.44	0.38	0.38	0.50	4.00	
0.03	1.00	0.38	1.58	0.23	1.00	-	1.08	1.88	1.50	-	0.73	0.62	1.73	0.92	0.62	2.62	0	0	4.00	17.99	9.00	1.56	2.94	5.56	8.38	2.47	1.13	3.56	9.69	5.20	2.60	7.75	7.19	9.31	4.67	9.40	11.07	4.40	1.93	3.13	1.00	0.20	2.94	1.44	0.88	0.06	0.19	0.13
29	26	26	26	26	26	-	26	26	26	-	26	26	26	26	26	26	15	16	15	14	14	15	16	16	16	15	16	16	16	15	15	15	16	16	15	15	15	15	15	15	15	15	15	15	15	16	16	
6.00	7.50	6.50	12.00	10.50	8.50	-	4.50	10.50	4.50	-	6.50	2.00	13.50	5.00	5.50	12.00	0	0	18.00	32.50	11.00	6.00	1.00	13.50	15.00	12.00	2.50	7.00	19.00	10.00	4.00	23.00	5.50	47.50	8.00	14.00	2.00	10.00	4.00	4.00	4.00	2.00	2.00	3.00	2.50	1.00	0	9.00
2	2	2	2	2	2	-	2	4	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2
26	53	29	41	51	34	-	16	45	19	-	14	16	37	14	21	40	0	0	44	135	37	47	10	40	15	17	40	15	15	4	5	48	15	98	8	14	12	4	6	12	7	22	15	10	3	19		
1	3	2	4	9	1	-	3	4	0	-	0	5	0	0	1	1	0	0	0	36	6	16	2	12	9	2	2	1	1	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	35	13	24	21	16	-	4	20	10	-	1	7	10	4	9	15	0	0	8	34	9	19	6	27	7	1	1	3	1	1	0	2	2	4	2	0	0	2	2	2	2	2	2	2	2	2	2	2
12	15	14	24	21	17	-	9	21	9	-	13	4	27	10	11	24	0	0	36	65	22	12	2	27	30	12	10	38	10	4	46	11	95	8	14	10	4	4	4	4	4	4	4	4	4	4		
0.50	1.50	1.00	2.00	4.50	0.50	-	1.50	2.00	0	-	0	2.50	5.00	2.00	0.50	0.50	0	0	4.00	18.00	3.00	8.00	1.00	6.00	4.50	2.00	1.00	0.50	4.00	1.00	0	24.00	2.00	1.00	0	0	0	1.00	0	0	0	0	0	0	0.50			
6.50	17.50	6.50	10.50	8.00	6.50	-	2.00	10.00	5.00	-	0.50	3.50	5.00	2.00	4.50	7.50	0	0	4.00	17.00	9.50	3.00	3.00	3.50	3.00	1.00	1.00	1.50	0.50	1.00	1.00	1.00	2.00	0	0	0	1.00	1.00	0	2.00	2.00	5.00	4.00	2.50	0.50	9.00		
13.00	26.50	14.50	20.50	25.50	17.00	-	8.00	22.50	9.50	-	7.00	8.00	18.50	23.50	5.00	20.00	0	0	22.00	67.50	18.50	8.00	5.00	20.00	15.00	4.50	8.50	20.00	15.00	5.00	5.00	7.50	49.00	8.00	14.00	2.00	12.00	4.00	4.00	6.00	12.00	7.00	7.50	5.00	0.50	9.50		

Table 2 - Catch Per Unit of Effort of $3\frac{1}{4}$ -Inch and $4\frac{1}{2}$ -Inch Multifilament and Monofilament Nets and Relative Efficiency of Monofilament Nets by Species and Season

Season	$3\frac{1}{4}$ -Inch Multifilament							$3\frac{1}{4}$ -Inch Monofilament							Relative Efficiency of Monofilament		
	Num-ber Red	Num-ber Chum	Num-ber Pink	Num-ber Nets	Catch Per Net			Num-ber Red	Num-ber Chum	Num-ber Pink	Num-ber Nets	Catch Per Net			Red	Chum	Pink
					Red	Chum	Pink					Red	Chum	Pink			
Spring	0	0	0	4	0	0	0	0	1	0	4	0	0.25	2	-	-	-
Summer	1,436	270	12	223	6.44	1.21	0.05	951	256	6	49	19.41	5.22	0.12	3.01	4.31	2.40
Total	1,436	270	12	227	6.33	1.19	0.05	951	257	6	53	17.94	4.35	0.11	2.83	4.08	2.20
Season	$4\frac{1}{2}$ -Inch Multifilament							$4\frac{1}{2}$ -Inch Monofilament							Relative Efficiency of Monofilament		
	Num-ber Red	Num-ber Chum	Num-ber Pink	Num-ber Nets	Catch Per Net			Num-ber Red	Num-ber Chum	Num-ber Pink	Num-ber Nets	Catch Per Net			Red	Chum	Pink
					Red	Chum	Pink					Red	Chum	Pink			
Spring	414	322	139	424	0.98	0.76	0.33	231	191	34	34	6.79	5.62	1.00	6.93	7.39	3.03
Summer	2,141	632	344	465	4.60	1.36	0.74	512	158	94	49	10.45	3.22	1.92	2.27	2.37	2.59
Total	2,555	954	483	889	2.68	1.07	0.54	743	349	128	83	8.95	4.20	1.54	3.34	3.93	2.85
Season	$3\frac{1}{4}$ -Inch Multifilament			$3\frac{1}{4}$ -Inch Monofilament			$4\frac{1}{2}$ -Inch Multifilament			$4\frac{1}{2}$ -Inch Monofilament			$3\frac{1}{4}$ -Inch		$4\frac{1}{2}$ -Inch		
	Num-ber Fish	Num-ber Nets	Catch Per Net	Num-ber Fish	Num-ber Nets	Catch Per Net	Num-ber Fish	Num-ber Nets	Catch Per Net	Num-ber Fish	Num-ber Nets	Catch Per Net					
Spring	0	4	0	1	4	0.25	875	424	2.06	456	34	13.41	-		6.51		
Summer	1,718	223	7.70	1,213	49	24.76	3,117	465	6.70	764	49	15.59	3.22		2.33		
Total	1,718	227	7.57	1,214	53	22.91	3,992	889	4.49	1,220	83	14.70	3.03		3.27		

The length-frequencies for red salmon caught in the $4\frac{1}{2}$ -inch and $3\frac{1}{4}$ -inch monofilament and multifilament nets are shown in figures 3 and 4. In both mesh sizes the length range is about the same for both net types but the mean length of the fish taken in the monofilament nets is larger (table 3) although the difference is not statistically significant. The shapes of the curves for monofilament and multifilament catches within each mesh size are similar but

Fig. 3 - Length-frequencies and average lengths of red salmon caught in $4\frac{1}{2}$ " monofilament and multifilament nets--summer 1962.

in the $3\frac{1}{4}$ -inch nets the secondary (right-hand) mode is more pronounced in the monofilament indicating the capture of a larger proportion of an older age-group in that net type. This secondary mode is made up of the same age-class (two winters-at-sea) as the mode in the $4\frac{1}{2}$ -inch mesh curves, but is centered at a slightly shorter length than that of the $4\frac{1}{2}$ -inch mesh nets. Therefore, while the $3\frac{1}{4}$ -inch monofilament nets do sample the older age class of red salmon, they select smaller individuals of that class.

Figures 5 and 6 show that chum salmon length-frequency curves are similar for monofilament and multifilament catches in the $3\frac{1}{4}$ -inch mesh size but in the $4\frac{1}{2}$ -inch nets the multifilament took smaller fish than the monofilament nets. Again, as with the red salmon, mean lengths were larger in the monofilament catches (table 3) although the difference is not sig-

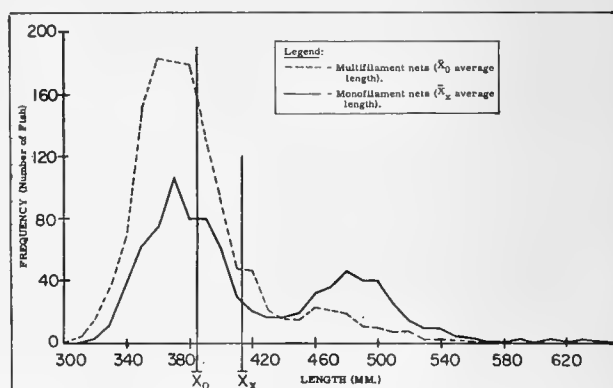
Fig. 4 - Length-frequencies and average lengths of red salmon caught in $3\frac{1}{4}$ " monofilament and multifilament nets--summer 1962.

Table 3 - Mean Lengths (mm.) of Salmon Taken in Multifilament and Monofilament Gill Nets

Species	Mesh Size	Mono.	Multi.	Diff.	Statistical Significance
	Inches	(Millimeters)			
Red	$3\frac{1}{4}$	413.5	384.5	29.0	None
Chum	"	430.8	412.9	17.9	"
Red	$4\frac{1}{2}$	511.5	500.0	11.5	"
Chum	"	526.6	509.7	16.9	"
Pink	"	499.6	493.9	5.7	"

nificant. From the shape of the $4\frac{1}{2}$ -inch monofilament curve, it would appear that this type of net is efficient in taking chum salmon over a large length range in that there is no modal peak as in the multifilament curve but, instead, a low plateau from 460 mm. to 560 mm.

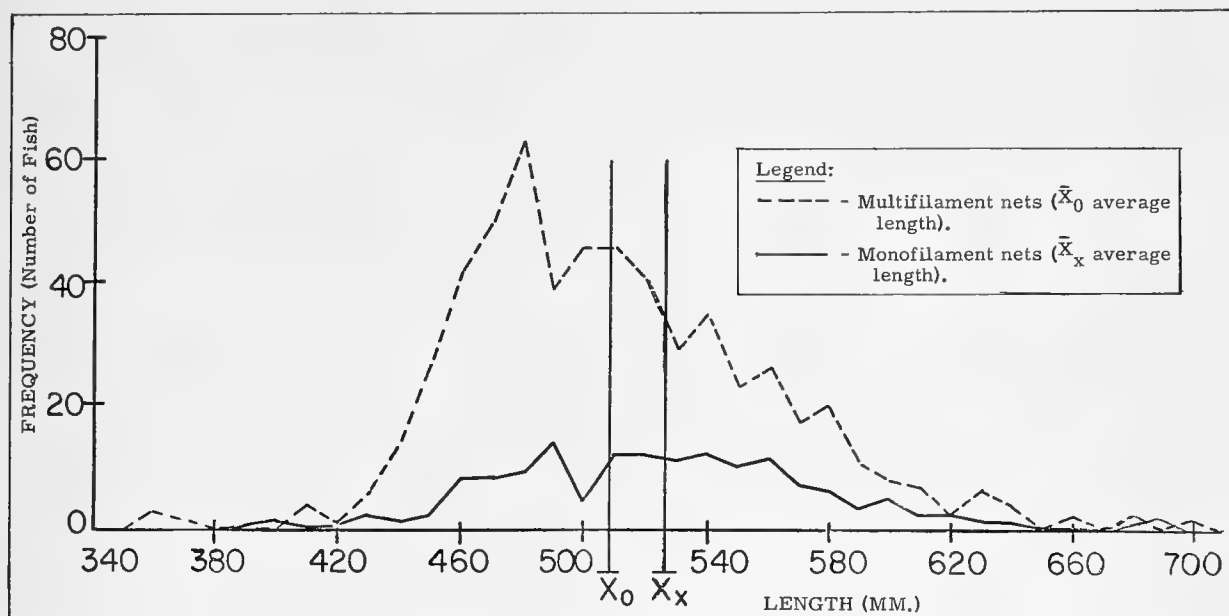


Fig. 5 - Length-frequencies and average lengths of chum salmon caught in $4\frac{1}{2}$ " monofilament and multifilament nets--summer 1962.

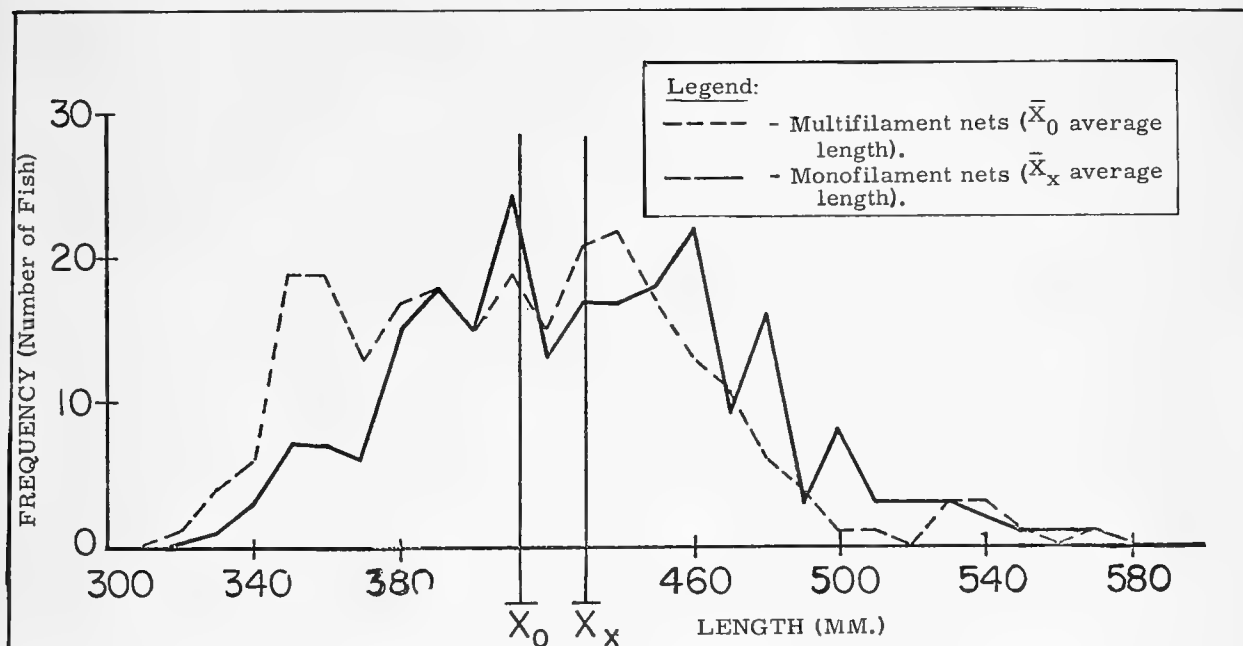


Fig. 6 - Length-frequencies and average lengths of chum salmon caught in $3\frac{1}{4}$ " monofilament and multifilament nets--summer 1962.

So few pink salmon were taken in the $3\frac{1}{4}$ -inch mesh nets that a meaningful length-frequency curve could be constructed only for fish caught in the $4\frac{1}{2}$ -inch mesh nets. Only one age class, the mature, one winter-at-sea fish, appears in the catch. Figure 7 shows the length-frequency curves for pink salmon taken in the $4\frac{1}{2}$ -inch multifilament and monofila-

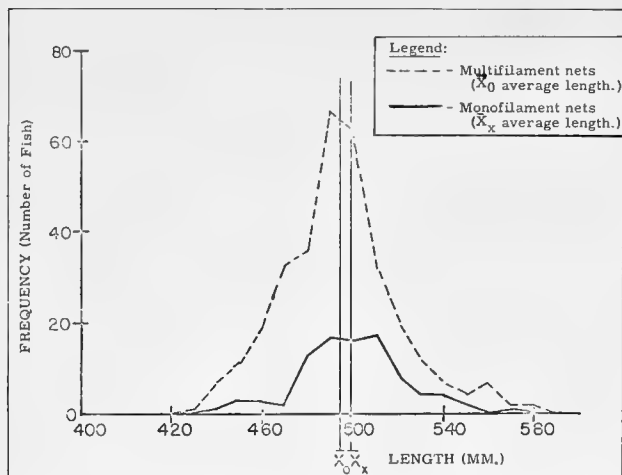


Fig. 7 - Length-frequencies and average lengths of pink salmon caught in 4½" monofilament and multifilament nets--summer 1962.

there is no difference in the proportion of one and two winter-at-sea red salmon, or one year old and older chum salmon taken in the two net types.

COMPARISON OF SPECIES COMPOSITION: In the comparative analysis of species composition of multifilament and monofilament gill net catches, a contingency table for catch by species was constructed for each set having at least five fish per species. Because of the lack of pink salmon samples in the 3¼-inch mesh, those comparisons were restricted to red and chum salmon. In the 4½-inch mesh, five sets were usable with all three species, 18 with

ment nets. The length range of fish taken in the two net types is about the same but, as with the chum salmon, the sharp peak of the multifilament curve does not appear in the monofilament curve. The mean length of the pink salmon is slightly greater in the monofilament catches (table 3) although not significantly so.

COMPARISON OF AGE COMPOSITION:

Experience^{1/} has shown that one and two winter-at-sea red salmon and one year old and older chum salmon can be reliably separated by length. In the previous section (Comparison of Salmon Lengths) it was shown that there is no significant difference in the lengths of red and chum salmon caught in monofilament and multifilament nets of either mesh size. The direct relationship between length and age, then, leads to the conclusion that

Table 4 - Comparison of Species Composition in Catches of Multifilament and Monofilament Gill Nets																
Set Number	3¼-Inch Multifilament						3¼-Inch Monofilament						X ²	Degrees of Freedom	Significance at 5 Percent	
	Red		Chum		Pink		Red		Chum		Pink					
	Ob-served	Ex-pected	Ob-served	Ex-pected	Ob-served	Ex-pected	Ob-served	Ex-pected	Ob-served	Ex-pected	Ob-served	Ex-pected				
21	222	200	45	67			136	158	74	52			22.01	1	✓	
22	121	122	14	13			68	67	6	7			0.24	1		
23	39	34	18	23			13	18	16	11			5.49	1	✓	
26	86	86	6	6			84	84	5	5			0	1		
30 1/	118	116	5	7			40	42	5	3			2.06	1		
31	96	95	15	16			50	51	9	8			0.22	1		
44	16	17	20	19			15	14	14	15			0.25	1		
45	12	11	12	13			11	12	15	14			0.32	1		
46	13	12	10	11			5	6	8	7			0.48	1		
											Total		34.12	9	✓	
4½-Inch Multifilament							4½-Inch Monofilament									
5	6	12	27	22	10	9	21	15	21	26	9	10	7.51	2	✓	
21	252	254	208	194	82	94	65	63	34	48	36	24	12.70	2	✓	
22	135	133	56	55	18	20	22	24	9	10	6	4	1.52	2		
23	25	26	28	33	63	56	12	11	19	14	16	23	5.69	2		
26 1/	134	132	6	10	50	48	30	32	7	3	9	11	7.53	2	✓	
											Total		34.95	10	✓	
4½-Inch Multifilament							4½-Inch Monofilament									
2	26	21	28	33			15	20	35	30			4.03	1	✓	
3	10	11	11	10			14	13	13	14			0.34	1		
4	41	45	40	36			24	20	13	17			2.54	1		
5	6	12	27	21			21	15	21	27			8.44	1	✓	
6	26	29	41	38			17	14	16	19			1.66	1		
9	49	49	45	45			21	21	20	20			0	1		
14	45	46	19	18			27	26	10	11			0.21	1		
16	16	14	7	9			11	13	9	7			1.61	1		
17	68	65	25	28			24	27	15	12			1.54	1		
20	60	60	14	14			36	36	8	8			0	1		
21	252	261	208	199			65	56	34	43			4.05	1	✓	
22	135	135	56	56			22	22	9	9			0	1		
23	25	23	28	30			12	14	19	17			0.83	1		
26 1/	134	130	6	10			30	34	7	3			7.52	1	✓	
28	18	19	12	11			10	9	5	6			0.42	1		
44	47	48	23	22			16	15	6	7			0.28	1		
45	23	20	5	8			7	10	8	5			4.28	1	✓	
46 1/	14	13	6	7			5	6	5	4			0.64	1		
											Total		38.39	18	✓	

^{1/}Includes 1 expected value of <5.

^{1/}Unpublished data, U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, Seattle, Wash.

red and chum salmon only. The contingency tables provide expected values with which the observed catch by species can be compared by chi-square tests. Table 4 lists the observed, expected, and chi-square values for each set and the total chi-square values for each mesh size. This series of tests, in effect, compares the set by set ratio of red to chum to pink (where pink salmon were caught in sufficient numbers) between the net types and is independent of changes in abundance, species ratios, or effort.

The results of all three series of tests, $3\frac{1}{4}$ -inch red and chum, $4\frac{1}{2}$ -inch red and chum, and $4\frac{1}{2}$ -inch red, chum, and pink, indicate significant differences at the 5 percent level between the species composition of the catches in multifilament and monofilament gill nets.

There appears to be no consistency in the differences between net types.

Table 5 - Catch Comparisons Between Multifilament Nets in Portions of String With and Without Monofilament Nets

Table 5 - Catch Comparisons Between Multifilament Nets in Portions of String With and Without Monofilament Nets																		
Number Set	X-Basic			Y-Control			Z-Experimental			X'-Basic			Y'-Control			Z'-Experimental		
	Num-ber 3 $\frac{1}{4}$ " Nets	Num-ber Salm-on	Catch Per Net	Num-ber 3 $\frac{1}{4}$ " Nets	Num-ber Salm-on	Catch Per Net	Num-ber 3 $\frac{1}{4}$ " Nets	Num-ber Salm-on	Catch Per Net	Num-ber 4 $\frac{1}{2}$ " Nets	Num-ber Salm-on	Catch Per Net	Num-ber 4 $\frac{1}{2}$ " Nets	Num-ber Salm-on	Catch Per Net	Num-ber 4 $\frac{1}{2}$ " Nets	Num-ber Salm-on	Catch Per Net
21	4	95	23.6	2	86	43.0	2	89	44.5	12	392	32.7	2	94	47.0	1	56	56.0
22	4	79	19.8	2	31	15.5	2	25	12.5	12	167	13.9	2	30	15.0	1	18	18.0
23	4	21	5.3	2	25	12.5	2	14	7.0	12	88	7.3	2	20	10.0	2	13	6.5
24	4	10	2.5	2	0	0	2	2	1.0	12	51	4.3	2	11	5.5	2	3	1.5
25	4	30	7.5	2	7	3.5	2	16	8.0	12	99	8.3	2	17	8.5	2	13	6.5
26	4	64	16.0	2	15	7.5	2	15	7.5	12	137	11.4	2	29	14.5	2	25	12.5
27	4	44	11.0	2	27	13.5	1	0	0	12	41	3.4	2	6	3.0	1	3	3.0
28	4	6	1.5	2	8	4.0	2	3	1.5	12	24	2.0	2	4	2.0	2	6	3.0
29	4	16	4.0	2	12	6.0	2	9	4.5	12	61	5.1	2	11	5.5	2	7	3.5
30	4	78	19.5	2	33	16.5	2	13	6.5	12	135	11.3	2	20	10.0	2	18	9.0
31	4	71	17.8	2	38	19.0	1	8	8.0	12	106	8.8	2	18	9.0	1	5	5.0
32	4	31	7.8	2	20	10.0	1	8	8.0	12	42	3.5	2	3	1.5	1	1	1.0
33	4	44	11.0	2	23	11.5	2	9	4.5	12	104	8.7	2	19	9.5	2	18	9.0
34	4	44	11.0	2	19	9.5	2	9	4.5	12	125	10.4	2	13	6.5	2	5	2.5
35	4	17	4.3	2	21	10.5	2	16	8.0	12	127	10.6	2	10	5.0	2	25	12.5
36	4	11	2.8	2	6	3.0	1	1	1.0	12	81	6.8	2	15	7.5	1	1	1.0
37	4	52	13.0	2	23	11.5	1	10	10.0	12	145	12.1	2	16	8.0	1	4	4.0
38	4	75	18.8	2	27	13.5	1	3	3.0	12	156	13.0	2	13	6.5	1	9	9.0
39	4	46	11.5	2	27	13.5	1	3	3.0	12	70	5.8	2	11	5.5	1	7	7.0
40	4	3	0.8	2	1	0.5	1	1	1.0	12	24	2.0	2	3	1.5	1	3	3.0
41	4	4	1.0	2	1	0.5	1	0	0	12	63	5.3	2	4	2.0	1	1	1.0
42	4	1	0.3	2	5	2.5	1	0	0	12	30	2.5	2	9	4.5	1	10	10.0
43	4	4	1.0	2	1	0.5	1	0	0	12	20	1.7	2	2	1.0	1	2	2.0
44	4	19	4.8	2	11	5.5	2	6	3.0	12	47	3.9	2	13	6.5	2	9	4.5
45	4	16	4.0	2	6	3.0	2	3	1.5	12	20	1.7	2	5	2.5	2	3	1.5
46	4	13	3.3	2	8	4.0	2	2	1.0	12	15	1.3	2	2	1.0	2	3	1.5
47	4	14	3.5	2	9	4.5	2	5	2.5	12	7	0.6	2	0	0	2	2	1.0
48	4	7	1.8	2	7	3.5	2	13	6.5	12	10	0.8	2	3	1.5	2	0	0
Total	112	915	8.2	56	497	8.9	45	283	6.3	336	2,387	7.1	56	401	7.2	43	270	6.3
Number Set	Basic Experimental			Control Experimental			Basic Control			Control								
	3 $\frac{1}{4}$ -Inch D	4 $\frac{1}{2}$ -Inch D'		3 $\frac{1}{4}$ -Inch D	4 $\frac{1}{2}$ -Inch D'		3 $\frac{1}{4}$ -Inch D	4 $\frac{1}{2}$ -Inch D'		3 $\frac{1}{4}$ -Inch D	4 $\frac{1}{2}$ -Inch D'							
21	-20.9	-23.3		-1.5	-9.0		-19.4	-14.3										
22	7.3	-5.1		3.0	-3.0		4.3	-1.1										
23	-1.7	0.8		5.5	3.5		-7.2	-2.7										
24	1.5	2.8		-1.0	4.0		2.5	-1.2										
25	-0.5	1.8		-4.5	2.0		4.0	-0.2										
26	8.5	-1.1		0	2.0		8.5	-3.1										
27	11.0	0.4		13.5	0		-2.5	0.4										
28	0	-1.0		2.5	-1.0		-2.5	0										
29	-0.5	1.6		1.5	2.0		-2.0	-0.4										
30	13.0	2.3		10.0	1.0		3.0	1.3										
31	9.8	3.8		9.2	4.0		-1.2	-0.2										
32	-0.2	2.5		2.0	0.5		-2.2	2.0										
33	6.5	-0.3		7.0	0.5		-0.5	-0.8										
34	6.5	7.9		5.0	4.0		1.5	3.9										
35	-3.7	-1.9		2.5	-7.5		-6.2	5.6										
36	1.8	5.8		2.0	6.5		-0.2	-0.7										
37	3.0	8.1		1.5	4.0		1.5	4.1										
38	15.8	4.0		10.5	-2.5		5.3	6.5										
39	8.5	-1.2		10.5	-1.5		-2.0	0.3										
40	-0.2	-1.0		-0.5	-1.5		0.3	0.5										
41	1.0	4.3		0.5	1.0		0.5	3.3										
42	0.3	-7.5		2.5	5.5		-2.2	-2.0										
43	1.0	-0.3		0.5	-1.0		0.5	0.7										
44	1.8	-0.6		2.5	2.0		4.3	-2.6										
45	2.5	0.2		1.5	1.0		1.0	-0.8										
46	2.3	-0.2		3.0	-0.5		-0.7	0.3										
47	1.0	-0.4		2.0	-1.0		-1.0	0.6										
48	-4.7	0.8		-3.0	1.5		-1.7	-0.7										
Total	70.7	3.2		88.2	5.5		-14.3	-1.3										
D ₂	2.52	0.11		3.15	0.19		-0.51	-0.05										
sd	46.21	32.26		18.84	12.21		24.82	13.36										
d.f.	27	27		27	27		27	27										
t	1.95	0.10		3.84	0.28		-0.54	-0.07										
Significant level	10%	-		0.1%	-		-	-										

EFFECT OF MONOFILAMENT NETS ON ADJACENT MULTIFILAMENT NETS: The design of the Bertha Ann net string during the summer season was such that any effect the monofilament nets had on the adjacent or nearby multifilament nets could be detected. For convenience, the following designations are given to the different portions of the net string (fig. 2):

- X--24 nets of basic string (multifilament)
- Y--4 nets of control portion (multifilament)
- Z--4 or 8 nets of experimental portion (multifilament and monofilament)

The Z portion was separated from the remainder of the string by a five-fathom line to make it an isolated unit. This portion was made up of alternated multifilament and monofilament nets of both mesh sizes.

The analytic procedure was to compute the difference in total catch per net, of the multifilament nets only, between portions X and Z (basic--experimental) and Y and Z (control--experimental) for each set (table 5). A comparison was also made between portions X and Y (basic--control) as a check of homogeneity in the two portions having no monofilament nets. These comparisons, of course, were done separately for the two mesh sizes. In table 5, the symbols X, Y, Z, and D refer to $3\frac{1}{4}$ -inch mesh nets and X', Y', Z', and D' to $4\frac{1}{2}$ -inch mesh nets.

The set by set differences (D and D') in the three comparisons were totaled and averaged, their variances computed, and a "t" test applied to each comparison for each mesh size. The hypothesis to be considered is that there is no difference between the catch per net (multifilament only) of the portions of the string with and without monofilament nets.

The results show, at the 10 percent level, that there is no difference between the catches in $4\frac{1}{2}$ -inch multifilament nets in portions of the string with and without monofilament present. Therefore, the presence of monofilament nets has no significant effect on adjoining $4\frac{1}{2}$ -inch multifilament nets. However, the "t" tests show that the catches of salmon in $3\frac{1}{4}$ -inch multifilament nets in the control and basic portions are significantly different from the catches in the $3\frac{1}{4}$ -inch multifilament nets in the experimental section indicating that, for this mesh size, the presence of monofilament nets decreases the catch of adjoining multifilament nets. The basic-control comparisons indicate no difference in catch per net of the two portions of the string containing no monofilament nets.

A summary of the catch per multifilament net for each mesh size of the three portions of the string is given in table 6.

The fact that the catch per net of the $4\frac{1}{2}$ -multifilament nets in the experimental portion is less than in the other sections leads to the general conclusion that catch per unit of effort is reduced in both mesh sizes of multifilament nets when monofilament nets are present, although the difference has statistical significance only for the $3\frac{1}{4}$ -inch mesh size.

String Portion	Catch Per $3\frac{1}{4}$ -Inch Net	Catch Per $4\frac{1}{2}$ -Inch Net
X (basic)	8.2	7.1
Y (control)	8.9	7.2
Z (experimental)	6.3	6.3

CONCLUSIONS

Based on the preceding analyses, monofilament gill nets alternated with multifilament nets can be described as:

- (1) outfitting a string of multifilament nets by at least 2 to 1;
- (2) catching salmon of the same mean length as the multifilament nets;
- (3) catching 1 and 2 winter-at-sea red salmon and 1-year-old and older chum salmon in the same proportion as the multifilament nets;

- (4) taking different proportions of red, chum, and pink salmon than do the multifilament nets;
- (5) significantly reducing the catch of adjacent or nearby $3\frac{1}{4}$ -inch multifilament nets and possibly reducing the catch of adjacent $4\frac{1}{2}$ -inch multifilament nets.

In general, monofilament gill nets appear to be superior to multifilament nets as a salmon-sampling device on the high seas because they greatly outfish the multifilament nets. Although their catches may differ in species composition, they sample the same populations of red, chum, and pink salmon as do the multifilament nets.

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PEST PLANT CONTROL ACHIEVED

Control of the pest plant, Eurasian watermilfoil (Myriophyllum spicatum) has been achieved under certain conditions in tests made by the U. S. Bureau of Commercial Fisheries in collaboration with the Maryland Game and Inland Fish Commission, the Chesapeake Biological Laboratory, Solomons, Md., and the Virginia Institute of Marine Science, Gloucester Point, Va.

Granules of the non-volatile ester of 2,4-D applied at 20-30 pounds acid equivalent per acre will control the pest plant without harming native vegetation. Water conditions and season of flowering of the plant must be considered in planning control operations. Effective control in tidal areas is possible only during a specific vulnerable period when the water is over 18° C. (64.4° F.) and before the plants begin flowering. The vegetative growth of the Eurasian watermilfoil should be sufficiently extensive to form a loosely woven mat of growth from top to bottom that will keep the herbicide from dispersing. In more protected areas, 2,4-D can be applied irrespective of tide. Elsewhere the best results come from treatment during the low-water slack just before ebb tide. In Chesapeake Bay, the best time for treatment is during the last 10 days of May or the first week of June.

Preliminary toxicological studies have indicated that the treatments do not directly damage macroscopic organisms, but further studies of this type are to be made. Effects of 2,4-D on oysters and clams were being studied at the Robert A. Taft Sanitary Engineering Center.

PRESENT AND FUTURE MARKET FOR FISH OIL^{1/}

By John A. Dyer*

ABSTRACT

Primary technical needs for improving the future of the fish oil industry are (1) a commercial method of separating the fatty acids or other derivatives and (2) development of markets demanding the highly unsaturated fatty acid compounds to be derived from fish oil.

In developing potential markets, however, we must not neglect the existing ones.

INTRODUCTION

The market for fish oil will undergo great changes in the future. Although I can't predict the changes in detail, I can report my observations and conclusions based on a preliminary economic and technical survey. The purpose of this article is to make these results available to industry.

In this article, I sketch major past and present uses of fish oil, give the needs of a market that fish oil could enter, and cover the unique property of fish oil. Finally, I show what can happen when technical research adapts characteristics of an oil to the demands of a substantial market.

MAJOR PAST AND PRESENT USES

The largest of all domestic markets for fish oil from 1935 to 1945 was the soap industry, when it used about 89 million pounds of fish oil per year (U. S. Bureau of the Census 1932-1962). This market dropped below 0.5 million pounds per year in 1951 and has remained below that level since. The drop occurred at a time when the price of fish oil was rising steeply and synthetic detergents were taking much of the soap market.

Over the years, drying-oil products--such as paints, varnishes, linoleum, and oilcloth--represent the most consistent large market for fish oil. During the past decade, drying-oil products have consumed an average of about 30 million pounds of fish oil per year. This market appears to be steady in the long-range view. Fish oil, being a natural drying oil, is used in the paint and varnish field as heat-bodied and blown oils and as modifiers in alkyd and other synthetic resins.

Fish oil was used extensively in this country in food products such as shortenings and margarines, reaching a maximum rate of 40 million pounds in the year of 1936. This domestic use has dropped below 0.5 million pounds per year since 1946, except in the years of 1950 and 1951 when higher usage was indicated, but available data do not state how much higher (U. S. Bureau of the Census 1932-1962). A large part of our recent production of fish oil has been exported to Europe for use in the manufacture of margarine.

NEEDS OF A MARKET THAT FISH OIL CAN ENTER

The most probable major market for fish oil in the future was aptly indicated in a recent chemical trade publication by the headline "Fats are seen likely to gain parity with coal and petroleum as organic chemical sources" (Oil, Paint and Drug Reporter 1962).

To enter the sophisticated chemical markets akin to those for the derivatives from coal and petroleum calls for considerably more development of fish-oil technology than we now

*Chemical Engineer, Technical Advisory Unit, Branch of Technology, U. S. Bureau of Commercial Fisheries, Boston, Mass.

^{1/}Talk presented to the Virginia Fishermen's Association, February 13, 1962, at Old Point Comfort, Va.

have. In the past, the users' requirements were flexible and non-specific enough so that he could accept a crudely extracted product that deteriorated to some extent on storage. The market for fatty oils now is more competitive and demands fish oils with greater freedom from such problem materials as free fatty acids, proteinaceous matter, excessive stearine, color bodies, and moisture. Although the fish oil industry is making progress toward a cleaner and hence more useful and stable product, the markets for fish oil are dynamically changing in the direction of demanding tighter specifications and even new basic qualities.

Demands in today's chemical markets are shifting toward purer, single chemical compounds or at least compounds within narrower ranges of chemical grouping. Fish oil can't escape from this trend if it is to break through into the high-priced markets its unique feature should command. To keep up with this trend, the industry must develop a commercially feasible process for separating fish oil into its component fatty acids or their simple derivatives. The fatty acids from fish oil are particularly difficult to separate because of their unusual chemical complexity. For instance, there are about 15 different fatty acids in hydrolyzed menhaden oil, considering only those present in relative concentrations of one percent or more (Ahrens et al 1959; and Gruger 1961^{2/}). This number is about double the highest number found in the same concentrations from any of the other major commercial fats and oils (Hilditch 1956; and Archer-Daniels-Midland no date). Practical methods for separating fish oil fatty acids or their derivatives are being sought in commercial and governmental research laboratories. Such methods must be found before advantage can be taken of the potentially favorable property unique to fish oil.

UNIQUE PROPERTY OF FISH OIL

The most-promising unique property of fish oil is its great concentration of highly unsaturated fatty acid compounds. Twenty to 30 percent of the fatty acids derived from menhaden oil are unsaturated to the extent of 4, 5, and 6 double bonds (Ahrens et al 1959; and Gruger 1961^{2/}). None of the other major oils can supply more than mere traces of these highly unsaturated fatty acids. Thus, the future of fish oil will find its greatest security and its highest value in the development of markets for which this high degree of unsaturation is essential. The most probable markets at present are in derivatives for manufacturing improved plastics.

WHAT HAPPENS WHEN RESEARCH ADAPTS CHARACTERISTICS TO DEMANDS

The effect of the kind of development that the fish oil industry needs is illustrated in figure 1.

Soybean oil, being a semidrying oil, was unsuitable--except in low concentration--for the paint and varnish manufacturing processes employed prior to 1930. By 1933, however, processes had been developed for the manufacture of alkyd resins incorporating drying or semi-drying oils as modifiers (Golding 1959). Through this technical development, soybean oil advanced in a few years from a minor to a major competitor in the field of drying oils, climbing from 2 to 22 percent of the supply for the drying-oil products market over a period of about 20 years.

Tall oil, another semidrying oil, made a spectacular entry into the drying-oil market in 1943. Prior to that time, the high content of rosin acid in tall oil made it unacceptable in the drying-oil market. During the early forties, technical advances in the processing of tall oil resulted in commercially economic methods for reducing rosin acids to concentrations below 1 percent (Pattison 1959). Tall oils, thus qualified for use in alkyds, climbed abruptly from 0 to 13 percent of the drying-oil products market in 12 years. These are examples of what the right technical developments could do for fish oil in drying-oil products or other markets.

Linseed oil comprised 90 percent of the oil for the drying-oil products market in 1925, as shown in figure 2. This level was cut in half by 1958. The decline was due largely to the

^{2/}Gruger, E. H., November 1961, "Results of Single Analyses of Commercial Crude Menhaden Oils, by Gas-Liquid Chromatography"; unpublished.

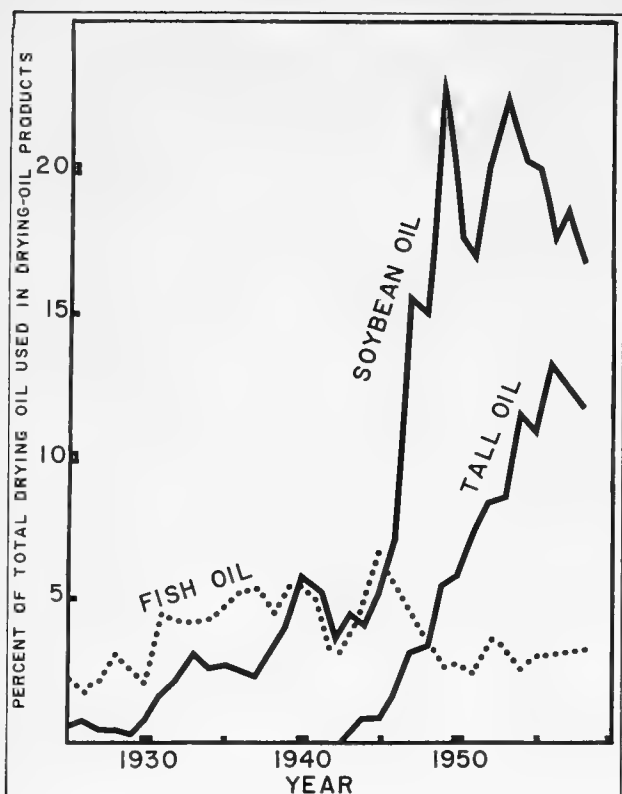


Fig. 1 - Relative use of fish oil, soybean oil, and tall oil in drying-oil products (U. S. Bureau of the Census, 1932 to 1961; and Banna 1954).

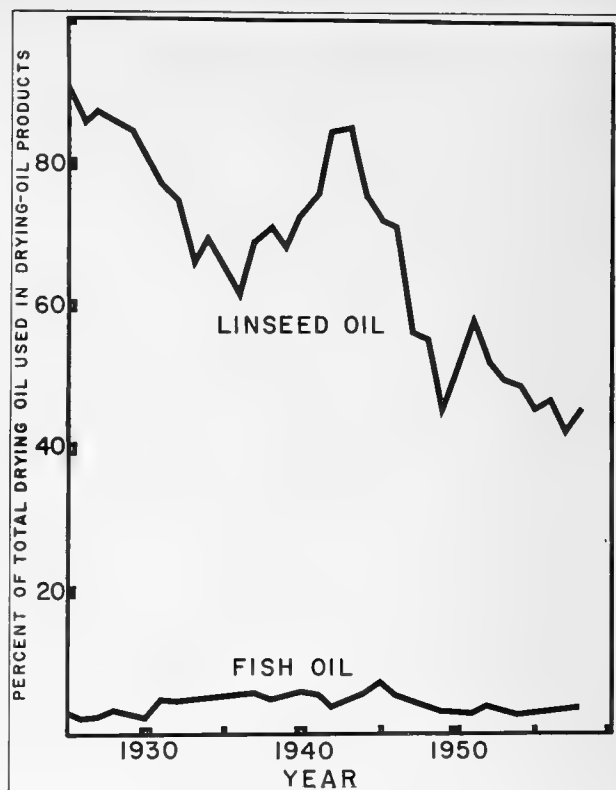


Fig. 2 - Relative use of fish oil and linseed oil in drying-oil products (U. S. Bureau of the Census, 1932 to 1961; and Banna 1954).

aggressive development of the competing oils shown in figure 1. Thus domination of a market can be countered with the aid of well-chosen technical developments.

SUMMARY

The great needs of the fish-oil industry are (1) practical methods for the separation of the complex set of fatty acid compounds in fish oil and (2) development of strong durable markets for the highly unsaturated fatty acids or their derivatives.

In the meantime, present day uses of fish oil can't be overlooked. Fish oil must be improved in quality, and current fish oil markets must be expanded to meet today's rising world production of fish oil and increasing competition from other oils.

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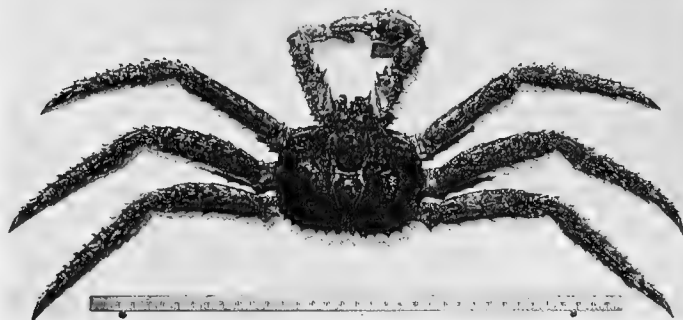
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ALASKAN KING CRABS DONATED TO PHILADELPHIA AQUARAMA

Unexpected visitors to the National Fisheries Institute 18th Annual Convention in Philadelphia, Pa., April 26-30, 1963, were four giant Alaskan king crabs--alive and kicking.



Actually, these Paralothides camachatica never got to Convention Headquarters--they were dropped off at the Philadelphia Aquarama, where they will make their permanent home.

The king crabs were donated to the new aquarama by an Alaskan firm.

They will be on display at the aquarama in a flood-lighted tank, with water kept to their favorite temperature. The crabs traveled in style by jet plane, packed in wet burlap and ice, and chaperoned by the manager of the firm's plant at Seldovia, Alaska. The trip took about 30 hours. The crabs were caught in Cook Inlet, an arm of the Gulf of Alaska.

These specimens bring to six the total of live Alaskan king crabs in the United States. The only other ones are at the New York Zoological Society's Aquarium in New York City.

These crabs--young ones chosen to withstand the hard trip--are typical of the Alaskan king crab canned and frozen for commercial consumption. In 1962, about six million of their brothers were caught and processed for the United States market. (Only the male king crabs are taken, and these must be at least 7 years old.) The Alaskan king crab as a frozen or canned seafood product is a postwar development and one which has been quickly accepted by the American homemaker.



TRENDS AND DEVELOPMENTS

Alaska

PROMOTIONAL CAMPAIGN FOR CANNED SALMON PROPOSED:

Salmon canning company representatives have suggested to the State Legislature that Alaska join with the industry in a campaign to promote the sale of canned salmon. As of February, it was reported that one million cases of pinks, 300,000 cases of reds, and 300,000 cases of chums of last year's salmon pack remained in warehouses unsold. That supply represents the packs of the smaller firms. Packs of the major brand labels have been marketed. The representatives stated that the primary reason the off-brand packs of salmon were not selling is that "canned salmon is losing shelf-space in the retail grocery stores."

The proposed advertising campaign would cost \$1.5 million a year with the State furnishing \$1.0 million and the packers \$0.5 million. It was suggested that the State could obtain approximately \$0.5 million by increasing the tax on unprocessed salmon which now runs about 3 percent of the value of the canned product. The proposal is currently under study by the State.

SALMON FORECASTS FOR 1963:

Bristol Bay: The expected total run of red salmon to Bristol Bay during 1963 is 15.6 million fish. This is based on an estimated return of 8.5 million "2-ocean" red salmon plus 7.1 million "3-ocean." The total estimate is about 2.8 million fish more than the actual return in 1962, which was a relatively poor year. Besides the usual inaccuracies inherent in the forecasts was added the inadequacy of information on the Japanese high-seas catch. Because of the difficulty in estimating the Japanese catch and the disparity of the estimates obtained by the different methods, the forecasters were unable to predict the distribution of the 15.6 million fish to the various fishing districts of Bristol Bay.

Prince William Sound: The run of pinks will be at least intermediate in size and there are some indications that it might be of large size, approaching the maxims of past years of more than 8 million fish. The run is expected early with fair fishing in some localities by July 1 and with heavy fishing during the last two weeks of July. A sharp decline in catches is expected in early August.

The chum salmon run may also be of fair size since frequently good runs of chums are associated with good runs of pinks. There was little basis for forecast of any run of red salmon in Prince William Sound.

JOINT ROE-HERRING FISHERY PLANNED:

A joint Japanese-Alaskan roe-herring fishery may be initiated this year in Prince William Sound. Japanese interests have been negotiating with a packing company to supply about 3,000 tons of roe-herring from the Prince William Sound area for landing aboard a Japanese mothership inside Alaska territorial waters. The roe would be brine-cured and the herring frozen. During the first year of operation, Japanese labor would process the fish aboard ship. United States vessels would supply the roe-herring at a price of \$40 a ton. The landings would be subject to the State raw fish tax of 4 percent. The arrangement appears agreeable with the Cordova Marketing Association and with certain State and Federal officials. Approval is required of the U. S. Department of Labor for use of Japanese nationals for the processing of fish in territorial waters. If the first year's operation was approved and a second were feasible, it appeared that the State would require use of Alaska labor for processing during the second and any subsequent years.

LATEST ADDITION TO KING CRAB FLEET HEADS NORTH:

The latest vessel to be converted exclusively for king crab fishing is the Shishaldin,

which has been chartered by a king crab fishing and processing firm. The 159' x 24' steel vessel will fish among the Shumagin and Aleutian Islands, and land her catches at Sand Point. The vessel is a former LCI (Landing Craft Infantry) and has a capacity of about 15,000 crabs in two forward tanks.

* * * * *

1963 KING CRAB PACK PROMISING:

The Laboratory Director of the Ketchikan Technological Research Laboratory visited shrimp and king crab processing plants in south central Alaska during February. He



The crab-fishing boat Irene G moved alongside a processing vessel, Alaska Trader, in bottle-necked Finger Bay at Adak, in the Aleutians.

reported that the king crab fishery was near its yearly peak of production, and that all ten plants visited were operating near capacity. Reports from Lazy Bay on Kodiak Island, and from Adak in the Aleutian Chain indicated record seasons for king crab in those areas.

* * * * *

NEW SHRIMP-PROCESSING PLANT:

A new shrimp plant in Kodiak began operating in mid-January. The plant has three peeling machines and packs both canned shrimp and frozen shrimp logs. The shrimp logs are similar to those manufactured at a plant in Seward and are being sold to a New Orleans firm for slicing, breading and marketing.



Alaska Fisheries Investigations

EARLY PLANKTON BUILD-UP INDICATED:

The following is a report of February 1963 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska:

The standing crop of surface zooplankton in Auke Bay is on the increase after the December-January low. This was determined on a schedule of night and day sampling cruises by the oceanography power barge Murre II. Among the plankton were organisms not observed before in Auke Bay, including one copepod, two amphipods, and an isopod. Procedures have been perfected for best use of the Miller high-speed plankton sampler and the in situ electrical salinometer and thermometer with the result that plankton and water data sampling is now accomplished very efficiently from the Murre II. Average temperature in the Auke Bay area for 23 stations was 3.8°C. (38.8° F.), while the average surface salinity was 29.7‰ (parts per thousand) and the average bottom salinity was 31.1‰.

A cooperative cruise with University of Alaska Marine Sciences Institute scientists at Douglas was also made with the Murre II in Taku Inlet. Samples were taken from the face of the glacier down channel through the long intermixing areas. A surprisingly high pH of 9.2 was recorded in the glacier flow. Both Auke Bay and Taku Inlet will show considerable increase in fish abundance with the end of winter.

These marine sampling cruises by the Murre II provide environmental background data for determining the factors which affect occurrence and abundance of fish such as young and adult salmon, herring, and smelt in the inshore areas of Alaska.

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ACTIVE KING CRAB FISHERY PRODUCES TAGS:

A larger volume of tag return data was received during February from the Alaska Department of Fish and Game Kodiak Research Center and processed at the Auke Bay Laboratory than in all previous months since the Alaska Peninsula king crab tagging study was initiated in July 1962. This was probably the result of intensified commercial fishing pressure coupled with the normal spawning migration habits of king crabs. A total of 319 recaptured tagged crabs was reported

during February. Two tags were recovered from those which had been released in 1957 by the U. S. Bureau of Commercial Fisheries Montlake Biological Research Laboratory. Fifty-four of the tags had been released a year ago by the International Pacific Halibut Commission incidental to a trawl survey. The Bureau staff aboard the vessels Yaquina and Paragon, under charter to the Alaska Region of the Bureau, released tagged crabs last summer also in the Kodiak-Alaska Peninsula areas, and 238 of these were recaptured in February. These recoveries are from a total release last year of 8,719 tagged crabs.

* * * * *

INITIAL SHRIMP SAMPLING SUCCESSFUL:

The new shrimp studies started in the summer of 1962 by the Auke Bay Biological Laboratory have had good success with initial trials of its sampling gear in the surrounding waters of the Kasitsna Bay Shellfish Station near Homer in Cook Inlet. The 10-foot try net has been working out well for sampling adult shrimp in Tutka Bay and Sadie Cove. Drags of 20 minutes in 45 to 50 fathoms have produced 75 pounds of shrimp. Most of the commercial species were taken in the trawl. Experimental shrimp pots in 20 fathoms of water in Tutka Bay were taking commercial species of shrimp on both rocky and mud bottoms, although there was some difference in occurrence of species noted. The samples are part of intensive life history studies of the commercially important shrimp to determine growth and reproductive and mortality rates as a basis for management of the resource.

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FISHERMEN'S COURSE AT KETCHIKAN:

The staff of the U. S. Bureau of Commercial Fisheries Technological Research Laboratory at Ketchikan cooperated with the University of Alaska in presenting a Fisheries Short Course in Ketchikan during February. An associate professor of fisheries biology in the Department of Wildlife Management at the University, supervised the course. It included 18 hours of instruction in basic oceanography, fishery biology, navigation, electronic aids, and handling, processing, and marketing of fishery products.



California

FISH PLANTED BY AIR FOR SPORTSMEN:

A total of 4,939,510 fingerling trout and salmon were air-dropped in 789 remote lakes in 1962, by the California Department of Fish and Game. In the previous year, 3,729,877 fish were planted by air in 804 lakes.

A breakdown of the various kinds of fish planted in 1962 shows air-planting of 1,708,495 rainbow trout, 1,278,290 eastern brook trout, 1,259,995 kokanee salmon, 371,790 cutthroat trout, 165,440 kamloops trout, and 155,500 golden trout.

California has found that fish planting by air saves time and is more economical than stocking remote areas by pack train or vehicle. (Outdoor California, February 1963.)

* * * * *

FISHERY PROJECTS CONSIDERED UNDER ACCELERATED PUBLIC WORKS PROGRAM:

Accelerated Public Works construction proposals submitted to the California Wildlife Conservation Board for consideration at a meeting on March 21, 1963, included the following fishery projects:

Hayfork Falls Fish Ladder Cost (\$49,800): The project would provide passage over a natural barrier which now prevents fish migration up Hayfork Creek, tributary to the South Fork of the Trinity River, Trinity County.

The California Department of Fish and Game estimates that the fishway would open up 19.8 miles of spawning and nursery area, primarily for steelhead, and would add about 3,000 steelhead to the Trinity River run.

Caspar Creek Fish Counting Weir Cost (\$50,000): The project would be located on Caspar Creek near Fort Bragg, Mendocino County. The weir, which would be operated by the Department of Fish and Game, would be used in the 12 to 15 year study on fishery stocks now being conducted by California Resource Agencies and the U. S. Forest Service with the assistance of the University of California. (California Department of Fish and Game, March 16, 1963.)

Note: Under the Accelerated Public Works program, the Federal Government provides assistance for State projects in certain areas on a matching funds basis.

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PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 63-2-Pelagic Fish
(February 11 and 15, 1963): To determine the distribution and abundance of pelagic schools, the inshore area from the United States-Mexican Border to Point Conception was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

The first day's survey covered the area from the Los Angeles-Long Beach Harbor to Point Conception. Dense concentrations of red tide were observed in the harbor and as far northward as Point Dume. The inshore waters were quite turbid throughout the entire area, and visibility was good.

On February 15, the area from the Los Angeles-Long Beach Harbor to the United States-Mexican border was surveyed in the morning. Red tide was visible from the Harbor southward to Solano Beach and, for the most part, extended to $1\frac{1}{2}$ miles offshore. In most areas, the red tide was so dense that fish schools, if present, would not have been observed. Visibility was restricted by haze and some clouds. In the afternoon, the coastline from San Diego to Point Conception was reflighted. Visibility was improved and two unidentified fish schools were noted off Del Mar in an area free of red tide. Red tide was seen as far north as Santa Barbara.

Adverse weather limited flying time to only 2 of the 5 days scheduled.

Airplane Spotting Flight 63-3-Pelagic Fish:
The area between Point Reyes and the United States-Mexican Border was covered by an air survey conducted on March 12 and 13, 1963. Weather conditions for scouting were ideal both days. Visibility exceeded 15 miles at all times, wind velocities were low, and few clouds were encountered.

On March 12, the area from the United States-Mexican Border to Point Conception was surveyed. Nineteen anchovy schools were seen--7 off Point Mugu and 12 in the Goleta area. A total of 26 gray whales were seen moving north.

The red tide observed was even more extensive than in the previous month. Discolored water was noted from below the Border to Santa Barbara, mostly in a band extending from just outside the surf line to about three miles offshore. In places, it spread as far

as five miles offshore. The fish schools noted at Point Mugu were in comparatively clear waters, although red tide was extensive in that area. The Goleta schools were in clear water. No fish schools were sighted between Point Reyes and Point Sal when the area was surveyed on March 13. Thirty-four gray whales were observed during the day. The water was clear except in the local area north of Santa Cruz where the inshore waters were discolored by river drainage.

Note: See Commercial Fisheries Review, February 1963 p. 20.

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RESEARCH GRANT FOR STUDY OF SQUID AND OCTOPUS:

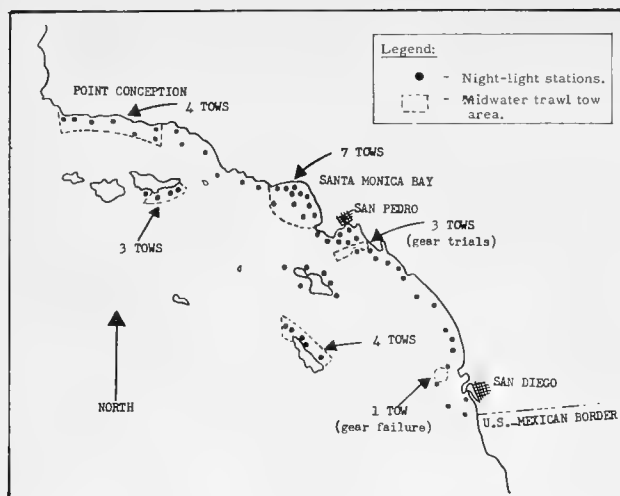
The National Science Foundation has awarded a \$29,000 research grant to the California Department of Fish and Game for a two-year study of squid and octopus. The study is expected to aid marine researchers by providing basic information on the part those cephalopods play in the food chains of many important ocean fisheries. A shellfish biologist of Redlands, Calif., who has made a lifelong study of squid and octopus, will be engaged to carry out the research project and to bring together present knowledge of squid and octopus. (California Department of Fish and Game, February 23, 1963.)

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POPULATION DENSITY, DISTRIBUTION, AND AGE COMPOSITION OF SARDINES AND OTHER PELAGIC FISH SURVEYED:

M/V "Alaska" Cruise 62-A-7 (November 21-December 7, 1962): The coastal waters of southern California including those around the Channel Islands between Point Conception and the United States and Mexican border were surveyed by the California Fish and Game research vessel to determine the strength of the 1962 sardine year-class. Other objectives of the cruise were: (1) to determine the population density and distribution of the adult sardines; (2) to survey other pelagic species for distribution, abundance, and age composition; and (3) to continue testing a midwater trawl as a sampling device for pelagic species.

On the 62 night-light stations occupied, not one sardine (young or old) was sampled or observed. This cruise was, in number of pelagic fish species attracted to the light, one of the least successful surveys in this area during the past decade. Jack mackerel were sampled on 3 stations, anchovies on 3, and bonito on 2.



M/V *Alaska* Cruise 62-A-7 Pelagic Fish (November 21-December 7, 1962).

During 344 miles of night scouting, 88 fish schools were observed. Poor visibility hampered scouting in one-third of the area surveyed. Schools sighted were: anchovy 34; bonito 39; jack mackerel 5; and unidentified 10. In addition to the 39 bonito schools sighted, many small clusters (20 fish or less) were observed.

Although night-light stations were made in areas where anchovy schools were sighted, they tended to avoid the light. On three stations, anchovies were observed displaying a negative phototactic response. Some minutes after the vessel was on station with the light on, a fish school was detected on the fathometer trace. With subsequent dimming and brightening of the light, the school moved vertically through the water in response to manipulations. The brighter the light, the deeper the school moved and as the light was dimmed, the school approached the surface. When the light was extinguished, anchovies were observed "flipping" on the surface.

Although 21 tows were made, only 18 were used for comparing catches of the midwater trawl with those of the night-light blanket net method.

A parted bridle cable curtailed 1 tow and 3 tows were made to indoctrinate laboratory personnel in the midwater trawl's use. The 18 trawl tows were made in 5 widely separated areas in which 21 night light stations were occupied. Only small amounts of squid and saury were attracted on 5 of the 21 light

stations. Catches by midwater trawl were predominately anchovy (about 10,000 pounds) plus 500-1,000 pounds each of jack mackerel, bonito, and squid. Only one sardine was captured in the 18 midwater trawl tows.

Although testing the midwater trawl as a device for sampling pelagic species is not yet complete, it is believed that it will prove to be an important adjunct to pelagic fish surveys.

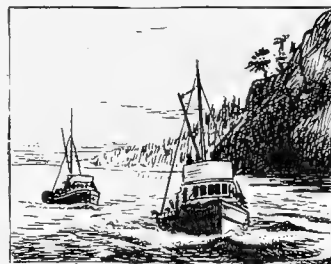
SALMON SPORT CATCH, 1962:

California sport fishermen took about 125,000 salmon in 1962 for their best year since 1956 when 176,000 were caught.



In 1962, sportsmen were aided by a regulation which allowed them to include 1 salmon under 22 inches in their 3 fish limit. About one-third of the salmon landed were under 22 inches in length.

Salmon were also in areas where skiffs and party boats could reach them in 1962. The range of those boats is limited and sport landings may fall substantially below the 100,000 mark even when fish are plentiful. This happened in 1961 when sportsmen landed only about 60,000 salmon, while commercial troll salmon fishermen were having their third best year in history.



Trollers on their way to fishing grounds.

Sport salmon fishing regulations for 1963 maintain the 3 fish limit in ocean waters and allow anglers to keep 1 fish under

22 inches but not less than 20 inches in length. (Outdoor California, February 1963.)

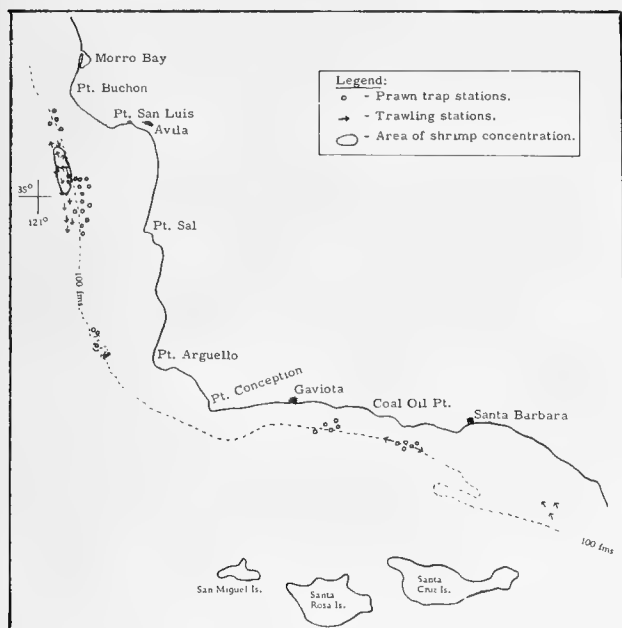
SHRIMP RESOURCES IN SOUTHERN AND CENTRAL COASTAL WATERS SURVEYED:

M/V "*Alaska*" Cruise 63-A-1 (January 17-February 7, 1963): The objectives of this cruise by the California Department of Fish and Game research vessel *Alaska* off southern and central California from about Santa Barbara to Monterey were: (1) to conduct ex-

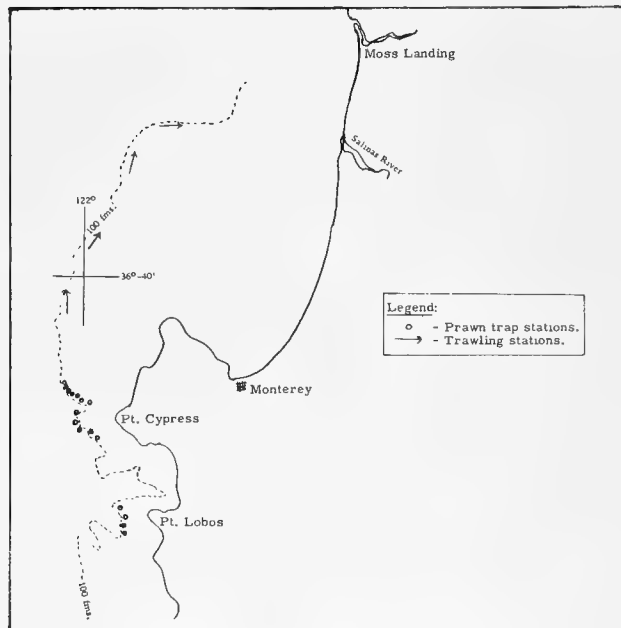
ploratory fishing for spot shrimp (Pandalus platyceros); (2) determine size, sex, and weight of shrimp from different areas; (3) use three different size and shape traps to determine fishing efficiency; (4) identify, count, and weigh all incidental species caught in traps; (5) make bathythermograph casts to obtain bottom temperatures at trap stations; and (6) run a series of gear trials with the gulf shrimp trawl and doors.

The shrimp taken in the Santa Barbara and Avila areas were placed in the live tank immediately after sexing and measuring. They were later transferred to the Menlo Park Laboratory for observation.

Samples of the shrimp taken in the Monterey area were sexed, measured, and weighed to determine heads-on count per pound. The catch was composed of almost equal



Area of operations of M/V Alaska during Cruise 63-A-1.



Shrimp traps were set in series¹ of 10 each at 10 stations off Coal Oil Point and Gaviota in the Santa Barbara area in 65 to 120 fathoms of water. Nineteen shrimp were caught in the 100 traps.

In the Avila area, traps were set off Point Arguello, Point Sal, and Point Buchon in 70 to 120 fathoms of water. Twenty-four trap stations yielded 16 shrimp. Seventeen tows with the Gulf shrimp trawl produced 106 shrimp.

In the Monterey area off Point Cypress and Point Lobos, shrimp were much more plentiful. Sixteen trap stations (156 traps) yielded 3,117 shrimp (heads-on); weighing 323 pounds; an average of 9.7 shrimp to the pound. Four tows with the Gulf trawl in Monterey Bay at 70 to 100 fathoms produced only three small shrimp.

numbers of males, transitionals, and females.

Heads-on counts ranged from 7.2 to 13.4 per pound. The mean carapace lengths for males, transitionals, and females were 37.0, 41.8 and 47.9 millimeters (1.46, 1.65, and 1.89 inches), respectively. Size, sex, and weight determinations were made for 100 shrimp. Practically all females were carrying eggs.

Three types of traps were used to determine fishing ability. The first was cylindrical and measured $3\frac{1}{2}$ feet long by 22 inches across. The second was rectangular, measuring 15 by 15 by 30 inches. Both of these were covered with 21 thread, $1\frac{1}{2}$ -inch mesh netting. The third trap type, a rectangular one having the same measurements as above, was covered by .026 gauge fiberglass. The fykes on all traps were constructed of the same mesh net and had two openings of $3\frac{1}{4}$ inches.

Fishing was started with 50 traps--30 of the cylindrical design, 10 rectangular with mesh netting, and 10 rectangular with fiber glass covering. For comparing their fishing ability, they were fished alternately on a 10-trap string at each station. For example, to compare rectangular traps of netting with cylindrical traps, 5 of each were used and these were alternately snapped on the long-line. The same fishing design was used to compare rectangular traps of netting with fiber glass covered traps.

Loss of 5 fiber glass covered traps prevented a comparison with round traps. Salted rockfish carcasses were the most satisfactory baits. Sardines, squid, and unsalted carcasses were also used as bait but carnivorous amphipods quickly skeletonized them, especially in waters over 100 fathoms deep.

At 4 comparable stations in the Monterey area, cylindrical traps caught an average of 37 shrimp (3.7 pounds) each compared to 19 shrimp (2.0 pounds) each for the meshed rectangular traps. At 3 comparable stations, the meshed rectangular traps caught an average of 29.8 shrimp (3.7 pounds) each as compared to 14.7 shrimp (1.5 pounds) each for fiber glass covered rectangular traps. The cylindrical traps had the highest average catch per trap at one station with 81 shrimp. The meshed rectangular traps were next with an average catch of 55 shrimp per trap at another station. The best catch for the fiber glass covered traps was an average of 20.4 shrimp per trap at one station.

It appears the cylindrical traps fished the best. However, had the rectangular meshed traps been of equivalent size they may have fished as well. Trap size may be an important factor in fishing success.

In the Monterey area, traps were fished across contours of the canyons. The traps were first hooked on a 100-fathom mainline at 10-fathom intervals.

One hundred fathoms of additional line was played out to shallow water where a 100-pound anchor chain was set. The traps were generally set in 110 to 75 fathoms of water and the anchor at 50 to 60 fathoms. Number 12 solid braid polypropylene line was used for the mainline and buoy line.

In general, where shrimp fishing was the best, very few incidental species were en-

countered. Sablefish (*Anoplopoma fimbria*) was the most frequently caught in the traps in all areas. Off Point Lobos, in 34 traps, 38 sablefish weighing 58 pounds were caught. Individual sablefish measuring up to 23 inches and 2.5 pounds in weight were caught. Other fish included juvenile rockfish, sand dabs, and hagfish. Invertebrates include box crabs, decorator crabs, red crabs, starfish, whelks, sea hares, and octopi. Octopi were caught in all areas, with the largest weighing 16.5 pounds.

Bathythermograph casts were made in all areas where large and small shrimp were caught. At the Monterey trap stations, bottom temperatures ranged from 8.7° C. (47.7° F.) at 130 fathoms to 10.6° C. (51.1° F.) at 70 fathoms. The average of bottom temperatures was 9.6° C. (49.3° F.). The surface temperature ranged from 12.8° C. (55.0° F.) with an average of 12.9° C. (55.2° F.).

In beds of shrimp (*Pandalus jordani*), off Avila, bottom temperatures ranged from 8.0° C. (46.4° F.) at 128 fathoms to 9.7° C. (49.5° F.) at 105 fathoms. The average temperature was 8.9° C. (49.8° F.). The surface temperature ranged from 12.7° C. to 13.2° C. with an average of 12.9° C. (55.2° F.).

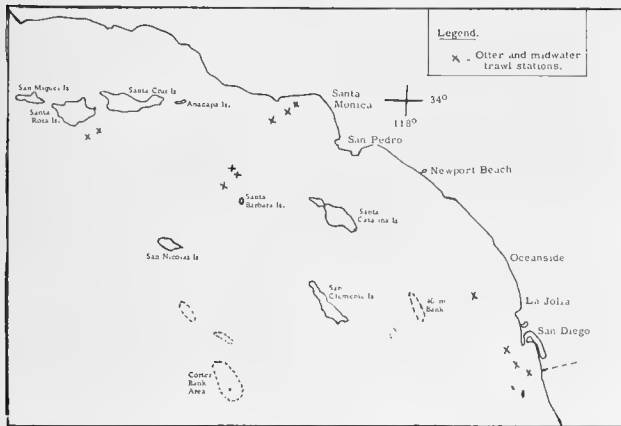
Trials with the Gulf of Mexico type shrimp trawl were successful. In the Avila area, exploratory tows were conducted for pink shrimp (*Pandalus jordani*). The gear consisted of a 41-foot head rope, 18-thread, 1¼-inch nylon mesh net, with 2½ by 5 foot doors (160 pounds each), and a 25-fathom bridle. Towing was done by a single cable. A shrimp concentration was found off Point San Luis in 105 to 130 fathoms of water. The school measured approximately 7.5 miles long with an average width of 1.1 miles. Seven tows within the perimeter of this school produced an average of 165 pounds per 20-minute tow, a catch rate of 495 pounds per hour. Two tows yielded catches at the rate of 819 and 810 pounds per hour. Samples from each tow were sexed, measured, and weighed.

Their age composition was 11 percent 10 months old, 29 percent 22 months old, and 60 percent 34 months old. The latter group was composed almost entirely of females carrying eggs. Heads-on counts ranged from 43 to 108 per pound with an average of 57.

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TRAWLING GROUNDS SOUGHT IN OFFSHORE WATERS:

M/V "N. B. Scofield" Cruise 63-S-1 (February 11-25, 1963): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in the coastal waters off southern California between the Channel Islands and the United States Mexican border were: (1) to explore offshore areas for trawling grounds, and (2) to make ecological surveys of representative areas.



Area of operations of M/V N. B. Scofield during Cruise 63-S-1.

In each of 6 different areas, bottom trawling stations were sought in depths of 20, 50, 100, 250, and 500 fathoms. Midwater trawling was also planned at each station. All tows were for 30 minutes. During the cruise, fish and invertebrates were identified, enumerated, and measured. Samples of unidentified or unusual specimens were saved for scientists.

SANTA MONICA BAY AREA: Stations were occupied in 100, 250, and 440 fathoms. Gear difficulties limited the catch of bottom fish. English sole (*Parophrys vetulus*) predominated at 100 fathoms. Shortspined channel rockfish (*Sebastes alascanus*), splitnose rockfish (*Sebastes diploproa*), Dover sole (*Microstomus pacificus*), and sablefish (*Anoplopoma fimbria*) were taken in the 250-fathom bottom tow. No fish were caught in the 440-fathom bottom tow.

Good catches of lanternfish (family *Myctophidae*) and lightfishes (family *Sternoptychidae*) were taken in 2 of 4 midwater tows.

SANTA BARBARA ISLAND AREA: Stations were established in 80, 100, and 250 fathoms. All 500-fathom areas scouted by fathometer were rocky. Curlfin turbot (*Ple-*

uronichthys decurrens) was the main species produced by bottom tows at 80 and 100 fathoms. Shortspined channel rockfish, splitnose rockfish and blackgill rockfish (*Sebastes melanostomus*) were most abundant in the deeper bottom tow. The deepest (125 fathom) midwater tow yielded a good catch of lanternfish.

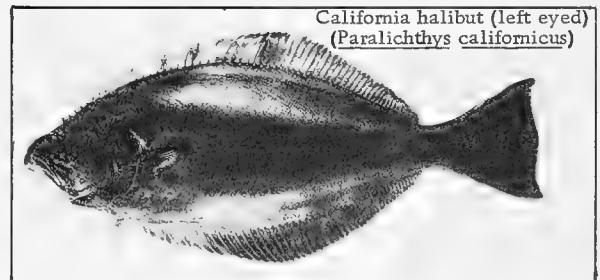
Although no commercially significant catches were made in the area, much of it is suitable for trawling and further exploration might prove valuable.

SANTA ROSA ISLAND AREA: This area was scouted by fathometer for four days. Depths of 20, 50, 100, 250, and 500 fathoms were investigated. No trawable areas could be found. Two bottom tows were attempted at 50 fathoms; both resulted in badly torn nets.

CORTEZ BANK AREA: The area was scouted by fathometer for two days. No trawable areas were found.

FORTY-MILE BANK AREA: The area was intensively scouted, but no trawable areas were found.

SAN DIEGO AREA: Bottom trawls were made in 25, 50, 100, and 400 fathoms. At 25 fathoms, California halibut (*Paralichthys californicus*) and fantail sole (*Xystreurys liolepis*) were most abundant. The tow at 50 fathoms



included 185 pounds of English sole, 56 pounds of Pacific sand dabs (*Cithanchthys sordidus*), 59 pounds of California pompano (*Palometa simillima*), and 105 pounds of pink seaperch (*Zalembrus rosaceus*). In the 100-fathom bottom tow, greenspotted rockfish (*Sebastes chlorostictus*) predominated. No fish were taken at 405 fathoms.

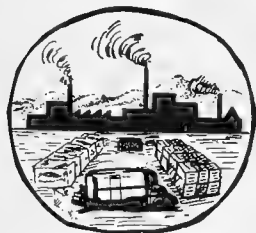
A significant catch was made in 1 of the 3 midwater tows. The productive tow was made at approximately 235 fathoms in 405 fathoms of water off La Jolla, Calif. It yielded a fine collection of bathypelagic fishes, including

lanternfishes, lightfishes, and deep-sea smelts (family Bathylagidae). Seventeen rare cephalopods, probably *Vampyroteuthis infernalis* were also taken in the tow.



Cans--Shipments for Fishery Products, January 1963

A total of 188,652 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January 1963, an increase of 3.2 percent from the 182,767 base boxes consumed during the same month in 1962.



Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.



Central Pacific Fisheries Investigations

SKIPJACK TUNA RESPOND TO UNDERWATER SOUND:

Experiments to determine the range and threshold of underwater sounds that skipjack tuna can perceive, and also to determine their ability to discriminate between various underwater sounds are being conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu.

Experiments using 500-cycle-per-second (c.p.s.) underwater sound as a conditioning stimulus have demonstrated that skipjack (*Euthynnus pelamis*) perceive underwater sound. A skipjack has been trained to respond to the 500-c.p.s. sound by swimming directly to a feeding area in its hold. A tank after it has been given the sound stimulus in another part of the tank. It swims to the feeding area about three times faster after the stimulus is presented than it does under control conditions (no sound stimulus).

The skipjack, which weighs about 5 pounds, is held in a circular swimming pool 23 feet

in diameter and 4-feet deep. The pool has aluminum sides and is lined with a thin vinyl plastic sheet. An underwater loudspeaker is concealed at the end of a 10-foot long corridor through which the skipjack swims. A curtain of minnow netting suspended in the water forms the corridor. The 500 c.p.s. sound is produced by an audio signal generator, passed through a band pass filter to eliminate harmonics, and further amplified in an amplifier before being transmitted by the loudspeaker. Intensities are measured by a hydrophone from a Navy sonobuoy coupled into a sound level meter. Spectrographic analysis of the transmitted sounds is made from tape recordings played into a vibralyzer.

Experiments are conducted in groups, each group consisting of 20 individual trials when the stimulus is presented to the skipjack. One specific decibel (sound intensity) level of the 500-c.p.s. sound is tested during each group of 20 trials.

As the skipjack swims past the underwater loudspeaker, the observer (concealed in an observation tower over the pool) closes a key activating the speaker. The time required for the skipjack to reach the feeding area is then recorded. Each trial is preceded by a control, this being the time required for the skipjack to reach the feeding area from the position opposite the loudspeaker when no sound stimulus is presented. When it reaches the feeding area after responding to the stimulus, the skipjack is rewarded with a piece of food. It is not fed during controls. The time between sound stimuli is randomly selected and is from 1 to 3 minutes. Upon perceiving the sound, the skipjack makes a hard left turn and doubles back along the outside of the corridor to the feeding area. During controls the skipjack makes a more leisurely circuit around the tank's perimeter until it enters the feeding area.

The table shows some of the typical response times recorded for groups of trials at 500 c. p. s.

Average Time From Speaker To Feeding Area (Seconds)	
Sound Off	Sound On
9.5	2.8
9.1	2.8
10.4	2.9
8.5	3.1

Experiments thus far have shown that skipjack perceive underwater sound and that it will be possible to determine the range and threshold of underwater sound perception for skipjack and other related species with the techniques described and relatively inexpensive facilities.

SKIPJACK TUNA SOUGHT EAST OF HAWAII:

M/V "Charles H. Gilbert: Cruise 63--
Boundary I (January 10-March 2, 1963): No
tuna schools were located during this cruise
by the U. S. Bureau of Commercial Fisheries
Honolulu-based research vessel Charles H.
Gilbert. The "boundary" for which the cruise
was named is the division between two im-
portant water types of the central Pacific,
the California Current Extension, and the
North Pacific Central water. Studies carried
out around the Hawaiian Islands during the
summer fishing season have indicated that
skipjack tuna (aku) schools are numerous
near this boundary. This cruise was aimed
at discovering whether this was also true in
winter, when the boundary lies in the vicin-
ity of 150° W. longitude, about 450 miles east
of the Islands.

Another purpose of the cruise was to col-
lect specimens of blood for typing. Exam-
ination of the blood types could reveal whether
the skipjack tuna found along the boundary in
winter are members of the population which
supports the Hawaiian summer fishery.

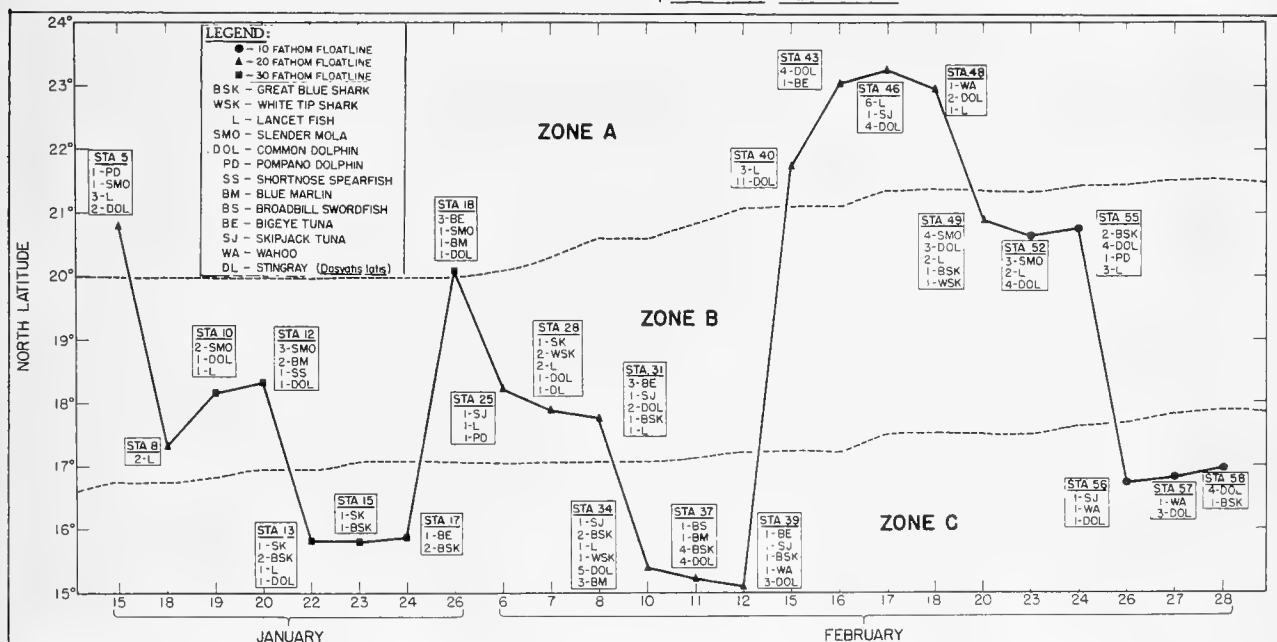
Fishing for skipjack tuna is generally done
with pole-and-line and live-bait. However,
because the area surveyed was so far from
base and because of the duration of the cruise
(almost 2 months), it was necessary to fish
for skipjack with tuna long lines.

Long-line stations were located north of,
south of, and in the boundary between the Cal-
ifornia Current Extension and the North Pacific
Central water. The boundary was identified
from surface salinity tests and isotherm plots
made during the cruise. Three complete sec-
tions of temperature and surface salinity ob-
servations (at 30-mile intervals) were made
across the study area. Several shorter sec-
tions were also made.

The spatial distribution of stations and catch
composition are shown in the figure. The over-
all catch of selected species is given in table.
Sixty baskets of 21-hook gear (1.5-fathom
droppers, 1.0-fathom leaders, 4/0 hooks)
were fished at all stations. Zone A stations
were located north of the boundary, zone B
stations in the boundary, and zone C stations
south of the boundary. A total of 9 stations were
occupied in both zone B and zone C, but only 6
long-line stations could be fished in zone A due
to heavy seas. Some experimenting was done
with float line length as indicated in figure.

Only nine skipjack tuna were caught in the
study area. No bird flocks or schools of other
tuna species were observed. Blood samples
were taken from skipjack. All fish were
measured. Gonads and stomachs were pre-
served from many of the fish.

Dolphin were quite common at all stations
in the study area. Pompano dolphin (*Cory-
phaena equiselis*) were observed at stations



Schematic diagram of long-line station location with station numbers and date occupied. Float line depth and catch are indicated for each station. All stations are in proximity to 150° W. longitude. Lines separating zones are diagrammatic.

Number of Selected Species Taken at Longline Stations in Zones A, B, and C. Catches are Based on 6 Sets in Zone A, 9 in B, and 9 in C.								
Zone	Whitetip Shark	Great Blue Shark	Lancetfish	Slender Mola	Common Dolphin	Blue Marlin	Bigeye Tuna	Skipjack Tuna
A	0	0	13	2	24	1	4	1
B	3	4	14	12	16	2	3	3
C	1	13	2	0	21	4	2	5

in zones A and B, but not in zone C. Pompano dolphin was easily differentiated from common dolphin (*Coryphaena hippurus*) while in the water by the former's lack of a yellow-pigmented caudal fin. Meristic counts were made on 90 common dolphin for comparison with 60 pompano dolphin which were taken with aku pole-and-line and subsequently preserved.

Other details of the cruise were:

1. Twenty-four 30-minute surface plankton tows were made.
2. A continuous record of surface temperature was maintained with the thermometer.
3. Canvas rafts which were attached to the end of the long-lines became waterlogged and sank after a few days.
4. Long-line depth was estimated with sounding tubes.
5. Blind chumming was performed on several occasions with no results.
6. Drift bottles and cards were released in the study area.
7. Ten nightlight stations were occupied.
8. In addition to trolling 2 surface lures at high speed between stations, 90 hours of approximately 5-knot trolling was performed. A total of 13 common dolphin, 1 pompano dolphin, and 2 small yellowfin tuna were taken by trolling.

Note: See Commercial Fisheries Review, February 1963 p. 23.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers during the fourth quarter of 1962 than in the same period of 1961. The decline was 21.0 percent in quantity and 17.1

percent in value. For the year 1962, purchases were down 0.4 percent in quantity, but up 15.4 percent in value from those in the previous year. The increase in value was due to the purchase of higher-priced fishery products and an increase in the price of most fishery products in 1962.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, October-December 1962 with Comparisons

QUANTITY				VALUE			
Oct.-Dec.		Jan.-Dec.		Oct.-Dec.		Jan.-Dec.	
1962	1961	1962	1961	1962	1961	1962	1961
..... (1,000 lbs.) .....				..... (\$1,000)			
5,422	6,863	23,356	23,450	3,413	4,115	14,388	12,470

Canned: Purchases of canned fishery products for the use of the Armed Forces in the fourth quarter of 1962 were much greater than in the same period of 1961. In the year

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, October-December 1962 with Comparisons

Product	QUANTITY				VALUE			
	Oct.-Dec.		Jan.-Dec.		Oct.-Dec.		Jan.-Dec.	
	1962	1961	1962	1961	1962	1961	1962	1961
..... (1,000 lbs.) .....				..... (\$1,000)				
Tuna	1,899	2,688	5,607	7,081	881	1,375	2,943	3,315
Salmon	2,279	-	3,295	1,403	1,160	-	1,798	893
Sardines	57	10	122	131	23	6	54	63

1962, purchases of the three principal canned fishery products (tuna, salmon, and sardines) were up 4.7 percent in quantity and 12.3 percent in value from those in the previous year.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, April 1963 p. 17.



Fishery Resources

THE SEA IS A GREAT UNTAPPED RESOURCE OF HUMAN FOOD:

The sea, with its vast untapped living resources, offers man his greatest challenge and his greatest opportunity in the quest to free the world from hunger, Secretary Stewart

L. Udall, U. S. Department of the Interior, said on March 21, 1963, in connection with the Freedom From Hunger Week proclaimed by President Kennedy.

National Freedom From Hunger Week, March 17-23, was especially appropriate be-

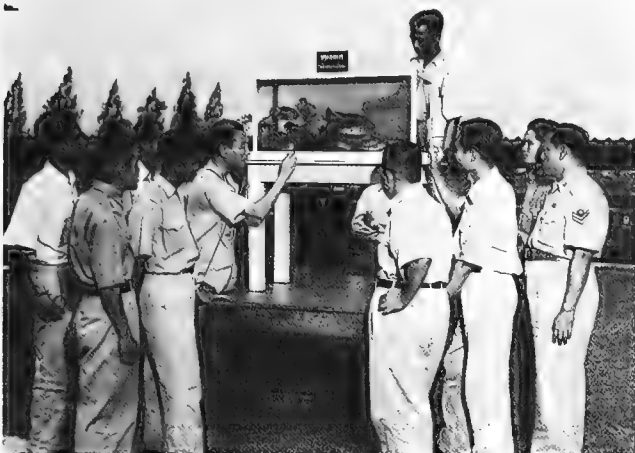


Fig. 1 - Characteristics of tilapia fish shown to Thai fisheries representatives meeting at Bangkhen Experiment Station. Visiting expert Dr. S. Ling (center) is briefing provincial fisheries officers and village chiefs on distribution of fingerlings to Thai farmers, one of the steps in fish pond culture projects being advised by technical assistance experts of FAO.



Fig. 2 - The best way of overcoming the general lack of protein in the diets of the Far Eastern population is by increasing the production and consumption of fish. To that end the FAO organized a fisheries seminar in Djakarta in 1952 to which 18 nations of the region participated. This photograph shows breeding carp being put into baskets to be transferred to breeding ponds, at the Tjinindi fish-breeding farm, Java, Indonesia.

cause as part of the Freedom From Hunger Campaign the United States will be host to the World Food Congress in Washington, D. C., June 14-18, 1963. The United States, as a member of the Food and Agriculture Organization (FAO) of the United Nations, is participating with nearly 100 other countries in the FAO international drive against hunger. About 1,200 people will participate in the June conference.



Fig. 3 - Thousands of people live from fishing along the coastal belt of Togo but their boats, equipment, and fishing methods are primitive and their catch is small. No mechanized fishing is yet practiced. Fish, however, is one of the most important sources of animal protein for the people of Southern Togo and the Government recently asked FAO to help improve the fishing industry. The former Director of the Fishing Service of British Guiana, was sent to Togo by FAO for this purpose. Fish are usually dried without cleaning and gutting, which reduces keeping qualities. The FAO expert demonstrates gutting to the fishermen.

In emphasizing the importance of Freedom From Hunger Week, Secretary Udall said:

"The United States has been uniquely blessed with its bounty of foods and it must exert world leadership in helping solve the food problems of the starving and malnourished peoples.

"While fishing for food has been one of man's means of existence since before the dawn of recorded history, we know little about the sea and its resources. We are approaching an era when man will harvest his food from the sea instead of hunting for it as he does now. Just as man moved from the land economy of hunting ages ago, and turned to a pasture and farm economy, so is he moving from an ocean economy based upon hunting for his food to a more productive and more certain way of obtaining food by managing the vast pastures of the sea."

The Secretary also quoted the President, who in a March 1961 message to the Congress, stated:

"The seas offer a wealth of nutritional resources. They already are a principal source of protein. They can provide many times the current food supply if we but learn how to garner and husband this self-renewing larder. To meet the vast needs of an expanding population, the bounty of the sea must be made more available. Within two decades our own Nation will require over a million more tons of seafood than we now harvest."

The Secretary said that fish protein concentrate (FPC) can contribute valuably to this program and emphasized the high priority the Department of the Interior is giving to developing this low-cost, high-protein fishery product. This has particular significance because one of the major items on the World Food Congress agenda is the role of fisheries in improving the nutritive diets of poorly fed people.



Frozen Foods

NEW LARGE SHIPPING CONTAINER DEVELOPED:

Two large United States companies have combined their abilities to give the frozen food industry a new, safer, and less expensive system for transporting foods that require regulated temperatures.

One of the firms has announced that it is ready to market a new, large, insulated shipping container that will protect frozen and other foods for long periods of time from outside temperatures. At the same time, the second firm said it is planning to offer

different size trucks and tractor-trailers equipped with the new food containers to food handlers on a lease basis.

The system permits unitized shipment of frozen and other temperature-sensitive foods aboard flatbed trucks and trailers without mechanical refrigeration. The specially-insulated containers will hold foods near the temperature at which they were put inside the container for several hours. In recent tests, frozen foods were put into the containers at -5° F. and after 24 hours in summer heat, it was found the foods had undergone a temperature rise of only five degrees.

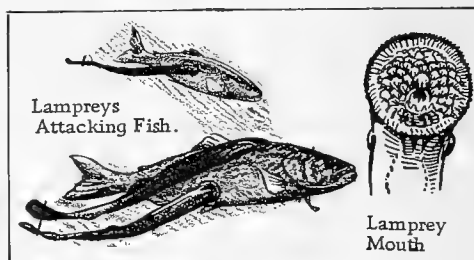
The system consists of a metal-covered box 95 inches long, 48 inches wide, and 85 inches high. Box-within-a-box construction is used with 3½ inches of polyurethane plastic insulation between the aluminum inner and outer shell. Ten units (holding up to 5,800 pounds) fit on a large flatbed semi-trailer truck. (Refrigeration Service and Contracting, January 1963.)



Great Lakes Fishery Investigations

RESEARCH VESSEL "SISCOWET" PROGRAM FOR 1963:

Assessing the abundance and distribution of young lake trout in Lake Superior will be the primary mission of the U. S. Bureau of Commercial Fisheries research vessel Siscowet in 1963. Quantitative measurements of hatchery-reared and native stocks become increasingly necessary during the early stages of sea lamprey control and lake trout rehabilitation. It is particularly important to determine when natural reproduction is re-established.



The tentative cruise schedule of the Siscowet in 1963 is as follows:

Tentative Cruise Schedule of Siscowet in 1963

Cruise	Period	Subject of study
I	May 6-17	Lake trout (gill nets)
II	June 3-14	Lake trout (trawl nets) Environmental survey
III	June 24-July 3	Lake trout (trawl nets)
IV	July 15-26	Lake trout (gill nets) Environmental survey
V	July 29-August 9	Isle Royale survey
VI	August 19-30	Keweenaw Bay survey
VII	September 9-20	Lake trout (trawl nets)
VIII	September 23-October 4	Lake trout (gill nets) Environmental survey
IX	October 14-25	Lake trout spawning
X	November 11-22	Whitefish spawning

Studies of the abundance and distribution of juvenile lake trout will be made from catches of experimental gill nets (cruises I, IV, and VIII) and trawl nets (cruises II, III, and VII) fished at various depths and locations in western Lake Superior. The gill nets and trawls will be systematically fished to provide information on the relative abundance of certain year classes and the seasonal distribution of the various size groups. Cruise IX will be devoted to the annual assessment of spawning populations of lake trout in the Apostle Islands region.

Environmental studies at three preselected limnological stations will also be made during cruises II, IV, and VIII. Special inquiry will be made into environmental factors which influence the seasonal depth and areal distribution of lake trout.

Cruises V (to Isle Royale) and VI (to Keweenaw Bay) will deal with the contribution of hatchery-reared lake trout to the native population and the relative abundance of small lake trout as compared to previous years. Some time will be spent in the Laughing Fish Point area investigating juvenile lake trout. Earlier work (1952-53) found young native lake trout most abundant in that region. Experimental fishing for chubs during cruise V may yield additional information on the identities of the various species.

The annual assessment of spawning populations of lake whitefish will be continued during cruise X. Spawning fish will be tagged and released on the spawning grounds to learn more of their homing instincts.

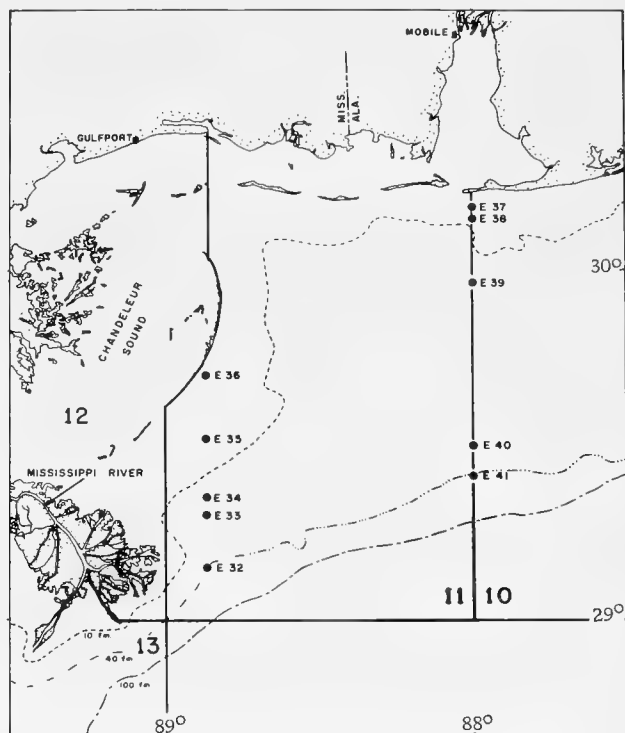
The dates and activities of certain cruises during 1963 may be altered to meet changing needs.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-2 (February 19-March 11, 1963): Catches were generally poor during this cruise off the coast of Texas, Louisiana, and Mississippi by the chartered research vessel Gus III. The vessel (operated



New areas investigated during Cruise Gus-2 of the M/V Gus III (February 19-March 11, 1963).

by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico. The cruise extended the investigation into a new area east of the Mississippi River Delta.

Ten statistical areas (10, 11, 13, 14, 16, 17, 18, 19, 20, and 21) were covered. Because of poor weather, fishing was difficult at times. However, one 3-hour tow with a 45-foot shrimp trawl was made in depths of 0-10 fathoms, 10-20 fathoms, and over 20 fathoms in each of the areas. Hydrographic observations were made as scheduled.

East of the Mississippi Delta, catches were extremely light. Not more than 2 pounds of shrimp were taken in any 3-hour tow in statistical areas 10 and 11.

West of the Mississippi Delta, the best single catch per 3-hour tow was 39 pounds of 15-20 count brown shrimp from 10-20 fathoms in area 14. The same area yielded 7 pounds of 15-20 count brown shrimp from the over 20 fathom depth. Other areas yielded light catches of brown shrimp as follows: 16 pounds (31-40 count) from the 10-20 fathom range in area 19; 9 pounds (31-40 count) from 10-20 fathoms and 9 pounds (21-25 count) from over 20 fathoms in area 13; and 9 pounds (15-20 count) from the over 20 fathom depth in area 16. The catch of brown shrimp in other areas did not exceed 7 pounds.

The only area producing more than a scattering of white shrimp was area 20 which yielded 21 pounds of 51-67 count shrimp from the 0-10 fathom range, and 6 pounds of 21-25 count shrimp from 10-20 fathoms.

Pink shrimp were taken at only 4 stations. The catch in each case was less than 1 pound.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, April 1963 p. 18.

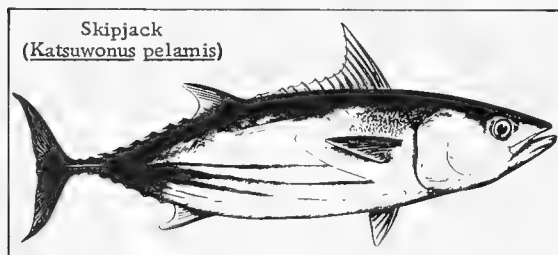


Hawaii

FISH AND SHELLFISH LANDINGS HIGHER IN 1961:

Landings of fish and shellfish in 1961 in the State of Hawaii totaled 14.5 million pounds with an ex-vessel value of nearly \$3 million according to the U. S. Bureau of Commercial Fisheries. This was a gain of 3.4 million pounds (30 percent) in volume and \$193,000 (7 percent) in value as compared with 1960.

Increased landings of skipjack tuna accounted for most of the increase. The gain



fulfilled predictions made by the Bureau biologists of a better than average year for skipjack landings. In 1961, the catch of skip-

jack averaged 6,000 pounds per trip, the fourth highest average catch per trip since 1952.

The Island of Oahu ranked first with a catch of 11 million pounds (76 percent). The Island of Hawaii was in second place with 1.9 million pounds, followed by Maui (1.3 million pounds). The remainder of the catch was landed at ports on the Islands of Kauai, Molokai, and Lanai. Tuna landings accounted for 86 percent of the quantity and 69 percent of the value of all fishery products landed in Hawaii.

The 1961 catch was taken by 589 fishermen. Fishing craft operated during the year included 65 vessels of 5 net tons and over, 195 motor boats, and 20 other boats.



Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January 1963: Based on domestic production and imports, the United States available supply of fish meal for January 1963 amounted to 20,780 short tons--7,379 tons (or 26.2 percent) less than during January 1962. Domestic production was 447 tons (or 16.4 percent) less and imports were 6,932 tons (or 27.3 percent) lower than in January 1962. Peru continued to lead other countries with shipments of 12,672 tons during January 1963.

U. S. Supply of Fish Meal and Solubles, January 1963 with Comparisons			
Item	January		Total
	1/1963	1962	1962
. . . . (Short Tons) . . .			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	-	-	243,839
Tuna and mackerel	1,708	1,641	20,874
Herring	2/	2/	3,543
Other	577	1,091	41,744
Total production	2,285	2,732	310,000
Imports:			
Canada	2,905	2,587	42,806
Peru	12,672	20,082	186,249
Chile	2,918	1,157	9,247
So. Africa Republic	-	1,500	10,084
Other countries	-	101	3,921
Total imports	18,495	25,427	252,307
Available fish meal supply	20,780	28,159	562,307
Fish Solubles:			
Domestic production 3/.	639	1,637	123,415
Imports:			
Canada	148	208	1,335
So. Africa Republic	-	-	1,717
Other countries	-	65	3,256
Total imports	148	273	6,308
Available fish solubles supply	787	1,910	129,723
1/Preliminary.			
2/Included with "other."			
3/50-percent solids. Includes production of homogenized condensed fish.			

The United States supply of fish solubles (including homogenized fish) during January 1963 amounted to 787 tons--a decrease of 1,123 tons as compared with January 1962. Domestic production and imports dropped 61.0 percent and 45.8 percent, respectively.

U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, February 1963: United States fish oil and fish solubles production in February 1963 was lower by 10.2 percent and 19.5 percent, respectively, as compared with February 1962. Fish meal production increased 25.8 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, February 1963					
Item and Period	1963	1962	1961	1960	1959
Fish Meal:					
Production 1/:					
April	-	6,311	6,179	5,076	6,810
March	-	2,495	2,751	2,955	2,122
February	2,600	2,066	2,071	1,923	2,128
January	2,285	2,732	2,723	2,443	3,095
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tots.	-	310,000	311,265	290,137	306,551
Imports:					
April	-	26,390	19,060	10,397	17,654
March	-	18,528	20,458	18,652	16,719
February	-	18,819	14,344	8,081	19,463
January	18,495	25,427	9,531	8,571	19,700
Jan.-Dec.	-	252,307	217,845	131,561	132,925
Fish Solubles:					
Production 3/:					
April	-	3,766	2,539	2,870	6,987
March	-	1,903	2,564	2,462	2,382
February	1,261	1,566	1,650	1,812	2,211
January	639	1,637	1,800	1,697	1,913
Jan.-Dec.	-	123,402	112,241	98,929	165,359
Imports:					
April	-	323	220	134	1,622
March	-	308	135	87	410
February	-	2,249	155	1,875	398
January	148	273	219	214	1,567
Jan.-Dec. totals	-	6,308	39	3,714	26,630
Fish Body Oils:					
Production:					
April	-	652	439	248	436
March	-	42	63	66	42
February	44	49	44	51	38
January	55	93	55	46	64
Jan.-Dec. prelim. totals 4/	-	33,178	33,471	26,690	24,418
Jan.-Dec. final tots.	-	-	34,409	27,853	24,945
Exports:					
April	-	1,327	980	761	1,116
March	-	2,556	753	421	600
February	-	2,886	2,327	3,177	999
January	10	679	1,793	276	898
Jan.-Dec.	-	16,407	16,331	19,154	19,264

1/Does not include crab meat, shrimp, misc. meals.

2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961, and 93 percent for 1962.

3/Includes homogenized fish.

4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 and 1963 are preliminary.

Production, January-February 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for February 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in table 1.

Table 1 - U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, February 1963 (Preliminary) with Comparisons				
Area	Meal Short Tons	Oil 1,000 Gallons	Solubles Short Tons	Homog- enized ^{3/} Short Tons
February 1963:				
East & Gulf Coasts .	622	7	118	-
West Coast ^{2/}	1,985	38	1,143	-
Total.	2,607	45	1,261	-
Jan.-Feb. 1963				
Total.	4,616	91	2,596	50
Jan.-Feb. 1962				
Total.	4,798	143	2,984	130

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes Hawaii, American Samoa, and Puerto Rico.

3/Includes condensed fish.

During January 1963 a total of 2,285 tons of fish meal and scrap and 54,654 gallons of marine-animal oils was produced in the United States. Compared with January 1962, this was a decrease of 447 tons or 16 percent in meal and scrap production, and a decrease of 38,282 gallons or 41 percent in oil.

Table 2 - U. S. Production of Fish Meal, Oil, and Solubles, January 1963 ^{1/} with Comparisons			
Product	January		Total 1962
	1/1963	1962	
..... (Short Tons)			
Fish Meal and Scrap:			
Herring	-	-	3,543
Menhaden <u>2/</u>	-	-	243,839
Sardine, Pacific	6	455	743
Tuna and mackerel	1,708	1,641	20,874
Unclassified	571	636	19,337
Total	2,285	2,732	288,336
Shellfish, marine-animal meal and scrap	<u>3/</u>	<u>3/</u>	21,664
Grand total meal and scrap .	<u>3/</u>	<u>3/</u>	310,000
Fish solubles	760	1,597	112,764
Homogenized condensed fish ..	50	40	10,651
..... (Gallons)			
Oil, body:			
Herring	-	-	666,503
Menhaden <u>2/</u>	-	-	30,548,560
Sardine, Pacific	-	14,200	23,589
Tuna and mackerel	37,344	37,816	621,903
Other (including whale)	17,310	40,920	1,584,445
Total oil	54,654	92,936	33,445,000
^{1/} Preliminary data.			
^{2/} Includes a small quantity produced from thread herring.			
^{3/} Not available on a monthly basis.			

1/Preliminary data.

2/Includes a small quantity produced from thread herring.

3/Not available on a monthly basis.

Tuna and mackerel meal amounted to 1,708 tons--accounting for 75 percent of the January 1963 meal total. Oil from tuna and mack-



erel (37,344 gallons) comprised 68 percent of the January 1963 oil production.

A total of 760 tons of fish solubles was produced in January 1963--less than half the production in January 1962. The production of homogenized condensed fish amounted to 50 tons--10 tons more than in January 1962.



Louisiana

SHRIMP AND OYSTER INVESTIGATIONS, 1962:

Highlights of the 1962 shellfish research and management program of the Louisiana Wildlife and Fisheries Commission were described in the March-April 1963 issue of the Louisiana Conservationist as follows:

Shrimp research in 1962 was greatly expanded. Weekly post larval and juvenile samples were taken throughout the year. Growth rates were established and the results when coordinated with hydrographic data furnished information needed for properly regulating the fishing season. Studies of the location and density of juveniles provided useful information for fishermen.

Both brown and white shrimp were successfully grown in experimental ponds. Mortality rates were lower than expected indicating that profitable production might be attained in ponds that were properly managed.

Management of oyster seed grounds involved shell plantings for cultch and the harvesting of seed oysters from Sister Lake on an alternate year experimental plan. Twenty-five thousand cubic yards of clam shells were planted as cultch in the Black Bay area of Louisiana. Seed oysters were found on over

80 percent of the planted shells. Production of seed and other type oysters from Sister Lake exceeded 23,000 barrels during September and October 1962. This reflects the success of the alternate year system of harvesting. Over-all setting of oysters on Louisiana's natural seed grounds in 1962 was the heaviest recorded in recent years, indicating excellent conditions for 1963.



Breaking up clumps of oysters from one of Louisiana's natural reefs.

Routine extension services to individual oyster growers were continued in 1962 at a level similar to past years.



Maryland

NEW DIRECTOR OF SEAFOOD PROCESSING LABORATORY APPOINTED:

The appointment of Dr. Mahlon C. Tatro as Director of the Seafood Processing Laboratory of the Natural Resources Institute, University of Maryland, was announced by the Institute on March 11, 1963.

Tatro received his doctorate in food technology from the University of Massachusetts. His previous experience includes positions with the United States Operations Mission, Santiago, Chile; a food products firm in California; and the Bureau of Laboratories, Vermont State Department of Health.

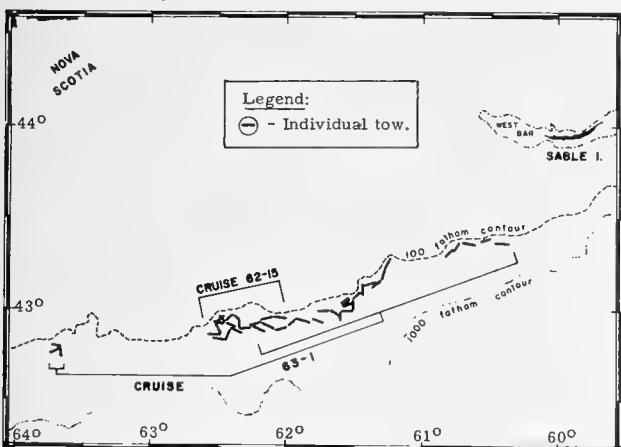
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North Atlantic Fisheries

Exploration and Gear Research

STUDIES ON COMMERCIAL FISHING POTENTIAL OF OCEAN PERCH IN DEEP WATER OFF NOVA SCOTIA CONTINUED:

M/V "Delaware" Cruise 62 (December 3-11, 1962) and Cruise 63-1 (January 28-February 5 and February 12-21, 1963): The second and third in a planned series of cruises to explore the Nova Scotian section of the Continental Slope with emphasis on a search for commercial concentrations of ocean perch (*Sebastes marinus mentella*) were completed by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware on February 21, 1963. Such concentrations,



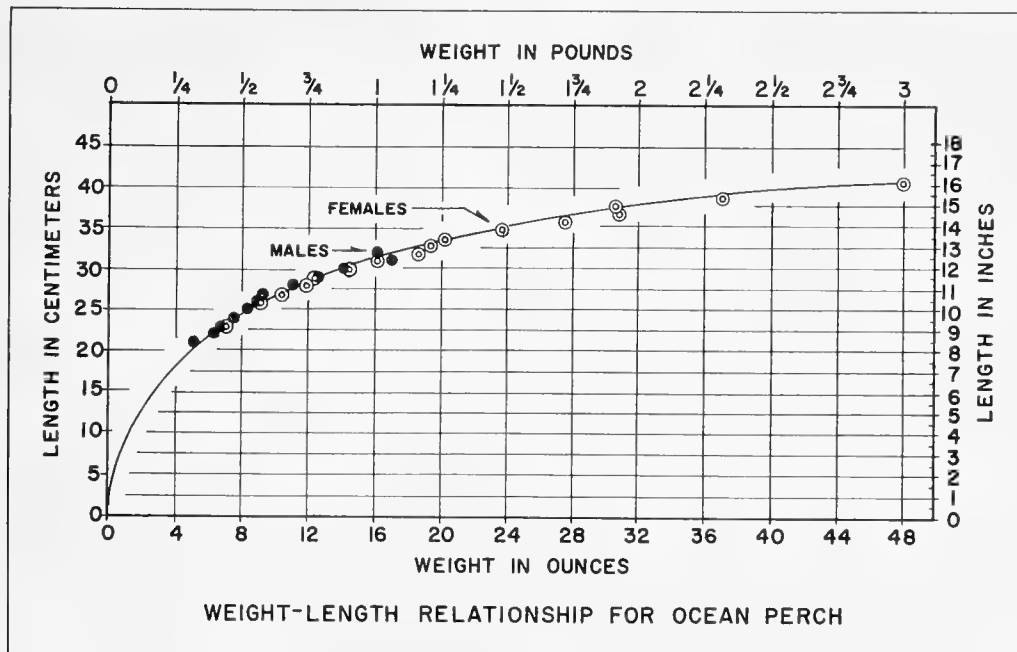
Cruises 62-15 and 63-1 of the exploratory fishing vessel Delaware.

nearer to home port, would permit commercial trawling in deeper waters than are now being fished and might provide supplemental areas for fishing during periods when weather conditions tend to restrict fishing effort or during periods when fish are scarce in other areas.

During cruise 62-15, a roller-rigged "number 41" otter trawl net was used without ground cables but with 5-fathom legs. During cruise 63-1, a "number 41 redfish net" was used with both 5-fathom legs and 5-fathom ground cables.

During the two cruises, 45 tows, of 45-minutes duration each were made; all tows were timed from "hook-up" to "knock-out". Of the 45 tows, 37 were made within the depth range of primary interest (200-500 fathoms). Due to the generally uneven and precipitous nature of the slope bottom in this area, an additional 5 tows, which were made near the shoal limits of the depth range, extended into depths of less than 200 fathoms; 2 tows, which were made near the deeper limits of the range, extended into depths greater than 500 fathoms. One additional tow was made entirely in depths exceeding 500 fathoms.

Coverage in the area fished was generally uniform with one exception--during cruise 63-1 a nearly untrawlable area was omitted in order to obtain greater coverage during the limited periods of fishing weather available in this general area during this season. At



the end of cruise 63-1, three tows were made in the area where the best catch resulted during the first in this series of cruises (cruise 62-11); poor catches resulted - the best of the three was only about 290 pounds in 45 minutes of towing.

The best catches of ocean perch, taken during the two cruises, were made in the depth range of 250 to 300 fathoms with the upper part of this range the most productive. Weight determination of all catches was made by volumetrically measuring the fish caught in bushel baskets and weighing one or more randomly-selected baskets of fish to determine the average (mean) weight per bushel; an extension of the mean weight, per basket, multiplied by the number of baskets gave the total estimated weight. The 4 best catches were all taken during cruise 63-1 and occurred on tows 10, 11, 14, and 23. The estimated weight of those catches was about 2,275, 2,950, 3,800, and 3,175 pounds, respectively. Bottom temperatures taken during these tows were, correspondingly, 5° C. (41.0° F.), 4.5° C. (40.1° F.), 4.75° C. (40.55° F.), and 5° C. The average (mean) weights of the perch taken during each of these tows are calculated to be 1.8, 1.7, 1.5, and 1.4 pounds respectively; the average (mean) lengths are correspondingly, 35.91, 35.57, 34.21, and 35.34 centimeters or approximately 14-1/8, 14, 13-1/2, and 13-7/8 inches. As length-weight information on ocean perch does not seem to be readily available, several bushels of fish were frozen and brought ashore for measuring and accurate weighing. These fish, as expected, were slightly lighter than the fresh, wet fish weighed aboard ship. However, the results, in graphic form are presented for general information and use in approximate weight determinations.

Length-frequency data was recorded from each catch of sufficient size for this purpose. Measurements were taken of total length and

Length-Frequency Data from Selected Catches						
Cruise No.	62-15	63-1	63-1	63-1	63-1	63-1
Tow No.	4	10	11	14	23	25
	.....(Centimeters).....					
Males:						
Max.	36	35	35	33	39	48
Min.	21	32	28	25	27	36
Mean	25.21	33.00	31.14	29.13	33.36	41.08
Median	26	32.5	30	28.5	34	41
Mode	26	32	30	28	34	43
Females:						
Max.	31	41	43	41	42	49
Min.	21	30	30	27	28	39
Mean	29.84	36.30	36.68	35.52	36.07	43.78
Median	30.5	37	36	36	36.5	43.5
Mode	31	38.5	36	38	37	43

read to the nearest centimeter. The largest fish were taken on cruise 63-1, Tow No. 25; the smallest were taken on cruise 62-15, Tow No. 4. The data from those tows are presented in the table together with those from the 4 largest tows described in the preceding paragraph.

The largest fish measured was a female taken during Tow No. 25, cruise 63-1; this fish was 49 centimeters long (about 18-7/8 inches). The two smallest fish measured were male and female fish of equal length taken during Tow No. 4, cruise 62-15; these fish were about 21 centimeters long (8-1/4 inches).



Oceanography

EDUCATIONAL GRANTS AWARDED TO AID NATIONAL PROGRAM:

As another step in a program designed to support the National Oceanographic Program through financial assistance to promising young scientists, the U. S. Department of the Interior has awarded 21 two-year graduate educational grants to 17 universities, Secretary of the Interior Stewart L. Udall announced on April 3, 1963. Universities will select individuals to receive grants and begin studies at the opening of the next school year.

Educational Grants for 1963/64 School Year		
Institution	Number of Grants	Field of Study
University of California (grants to Scripps Institution of Oceanography)	2	Physical Oceanography Biological Oceanography
Oregon State University	2	Physical Oceanography Technology
University of Washington	2	Physical Oceanography Fishery Biology
Johns Hopkins University	1	Physical Oceanography
University of Rhode Island	1	Physical Oceanography
New York University	1	Physical Oceanography
Duke University	1	Biological Oceanography
University of Hawaii	1	Fishery Biology
University of Miami (Fla.)	2	Fishery Biology Taxonomy
North Carolina State College	1	Fishery Biology
University of Michigan	1	Taxonomy
University of Texas	1	Taxonomy
Iowa State University	1	Taxonomy or Biometrics
Michigan State University	1	Technology
University of Massachusetts	1	Technology
Rutgers University	1	Technology
University of Florida	1	Economics

The grants include 6 in physical oceanography, 2 in biological oceanography, 4 in

fishery biology, 4 in taxonomy, 4 in fishery technology, and 1 in economics.

All tuition fees are paid for each student selected, and each will receive \$3,000 for living expenses on a 12-month basis. Married students with children will receive an additional \$1,000 family allowance. At the close of each academic year, the student's progress is reviewed before the second year of the grant is approved.

The grant program, the Secretary explained, began in 1962 in accordance with Congressional action. It is administered by the Bureau of Commercial Fisheries of the Fish and Wildlife Service to assist in developing the scientific manpower necessary in the expanding National Oceanographic Program and the needs for fishery biologists. Grants were made to 12 universities last year and 17 graduate students are now in the first year of the program.

Selection of the institutions to receive the grants was made by the Department with the advice of a panel of consultants from leading universities and research institutions. Invitations to participate in the program are sent to qualified educational institutions. Twenty-five institutions and 77 students were considered in the selections made in 1962. Twenty-eight institutions and 92 students were considered for the 1963 awards.

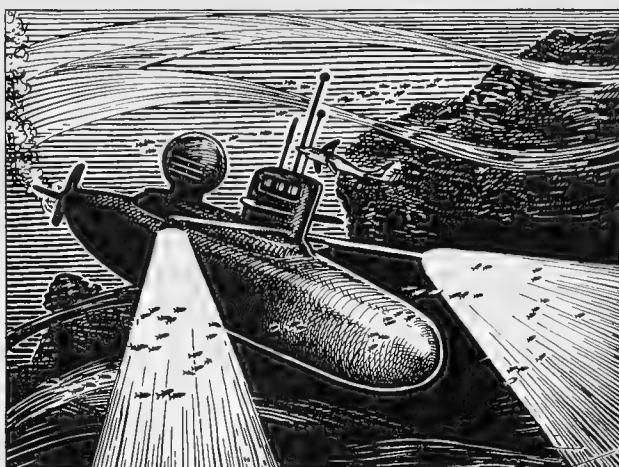
For eligibility under the grant program a student must have been graduated or is about to be graduated. He may then file with a university of his choice and designate the field in which he desires to continue his education. If that university is one selected for the grant, the student must then meet the qualifications set by that institution and face whatever competition there is by other students striving in the same field.

Most of the 17 students who are studying under grants awarded in 1962 are in their third, fourth, or fifth year of graduate work. Two are in their first year and three are in their second year.

* * * * *

FEASIBILITY STUDY OF RESEARCH SUBMARINE PROPOSED:

The U. S. Department of the Interior has proposed a study that could lead to the construction of a nuclear-powered research sub-



Artist's version of a mesoscaphe.

marine, or mesoscaphe, to explore the deep frontier of the ocean. Such a mesoscaphe, which literally means "middle boat," could carry out studies on marine fishing and mineral resources, disposal of atomic wastes, national defense, and weather predictions, according to Secretary Stewart L. Udall, U. S. Department of the Interior. Biological, physical, and chemical oceanography are prime investigational areas for a research mesoscaphe, he said.

According to the Director of the Bureau of Mines, the submarine's mineral missions would include investigations of marine mineral resources such as coal, petroleum, and metals. It would probe the bottom of the sea by obtaining cores drilled from the ocean floor.

The Director of the Bureau of Commercial Fisheries noted that a mesoscaphe operating to depths of 1,000 feet could obtain important records of temperature, salinity, dissolved oxygen nutrients, light, and the vagaries of ocean currents. Techniques presently available for underwater observations are largely limited to SCUBA diving, underwater photography and television, underwater viewing ports in surface craft, and bathyscaphes which are usually capable of only vertical movement.

On the other hand, a mesoscaphe with its lateral movement, could scoop up various types of plankton, follow sonar-tagged fish with instruments, and, by using lights, study many of the strange undersea creatures now known only from museum specimens. Viewing ports would allow direct observation of bottom fish and shrimp on the Continental Shelf and on the fishing banks. The reactions

of fish to fishing gear and the effects of fishing vessel noise on fish could be studied.

The all-weather capability of a submerged craft would permit its use at all latitudes during stormy seasons.

The mesoscaphe, as visualized by scientists, would require a submerged speed of 20 knots in order to track and study large fish, such as sharks and tuna. The vessel would have to be capable of staying submerged as long as six weeks to allow uninterrupted studies of biological and oceanographic changes. The length of the research submarine would have to be less than 200 feet for maneuverability. Nuclear power might be necessary to meet those requirements.

The Department of the Interior has asked Congress for funds to carry out a feasibility study on the mesoscaphe. Hull and power plant design, construction features, type of undersea collecting gear, and crew training problems would be included in such a study.

The study was proposed as part of the National Oceanographic program which is being planned and coordinated by the Inter-agency Committee on Oceanography of the Federal Council for Science and Technology.

"We need better eyes in the sea, eyes comparable in power to those with which scientists are probing outer space," Secretary Udall said. "We need to apply our technological abilities to more intensive probing of inner space, the world ocean."

* * * * *

NEW RESEARCH AIDS FOR WOODS HOLE OCEANOGRAPHIC INSTITUTION:

A converted four-engine C-54 airplane capable of taking scientists and equipment to any part of the world's oceans was to be delivered to the Woods Hole Oceanographic Institution, Woods Hole, Mass., late in the spring of 1963. The airplane was converted for science by an aircraft company in Miami, Fla., under grants from the Office of Naval Research and the National Science Foundation.

The C-54 will be operated by the Institution on a continuing loan from the Office of Naval Research. It will be used mainly for meteorological studies, but it will also be equipped for tracking scientific buoys, taking

temperature readings, and geological and geochemical studies. Its normal complement will be a scientific party of 8 and a crew of 5. Its first major assignment will be to the Indian Ocean in May 1963, according to the Director of the Institution.

The airplane is part of a continuing development program aimed at providing maximum facilities for an expanding basic research program at Woods Hole, according to the Director.

The Director said the Institution was also acquiring the following major new facilities as part of the current development program:

A 210-foot research vessel, the Atlantis II which was scheduled for delivery late in January 1963. The modern oceanographic vessel will have a range of 8,000 miles. It has accommodations for a crew of 28 and a scientific party of 25. Costing around \$4 million, the Atlantis II was built under a grant from the National Science Foundation.



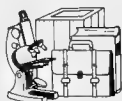
Artist's conception of the Atlantis II.

A 50,000-square foot biology and chemistry research laboratory now being erected in Woods Hole and scheduled for completion in the summer of 1963. It will provide space for about 150 investigators, as well as an auditorium seating 250 persons. The main source of funds for the new laboratory was a \$2 million grant from the National Science Foundation.

A 99-foot research vessel, the Gosnold, which was converted from an Army cargo ship and delivered in December 1962. The Gosnold will be used principally for short cruises in local waters and along the continental shelf. It cost around \$35,000 and was paid for from the Institution's private funds.

A 20-foot submarine, capable of diving 6,000 feet into the ocean, scheduled for delivery late in the summer of 1963. The underwater craft, accommodating a pilot and one scientist, is designed for scientific studies of currents, turbulence, temperature, salinity, sound velocity, and biology--principally along the continental shelf. It was financed by a \$575,000 grant from the Office of Naval Research.

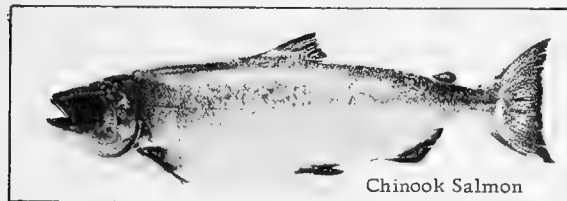
The Director said that those five major additions to the Institution's facilities, all within less than one year, should meet the needs of their scientific program for the immediate future. (*Newsletter*, January 31, 1963, United States National Oceanographic Data Center.)



Oregon

HATCHERIES MAINTAIN SPRING CHINOOK SALMON RUN IN THE MIDDLE WILLAMETTE RIVER:

Construction of the Lookout Point-Dexter hydroelectric facilities left the spring chinook run in the Middle Willamette River heavily dependent on Oregon fish hatcheries. During late summer and fall, as the spawning period approaches, there is a heavy draw-down of the Lookout Point pool. This causes water temperatures in the river to rise above 60° F. Incubation of spring chinook salmon eggs at such relatively high temperatures results in heavy egg mortality and a high rate of fry deformity.



Chinook Salmon

In 1955, the Oregon Fish Commission established a salmon trapping facility below Dexter Dam. Chemical treatment of adult salmon during the holding period, transfer of adults to holding ponds at the Willamette Hatchery near Oakridge, Ore., pasteurization of the salmon viscera used in fingerling food, and the development of the Oregon pellet for feeding fish have all contributed to a brighter outlook for the Middle Willamette run.

Approximately 1½ million yearling spring chinook were released in the Middle Willamette River in early 1963. Over 3 million young chinook are being reared for release during the early spring of 1964.

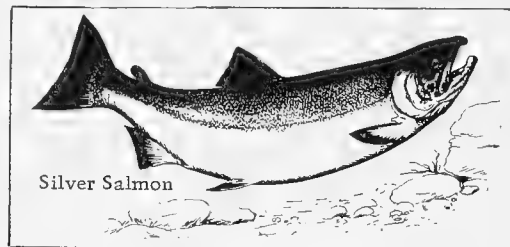
A record total of over 4½ million spring chinook eggs was taken from fish trapped at Dexter Dam during the 1962 season. The 2,193 adults trapped at Dexter in 1962 was slightly below the 2,240 annual average in the years since 1955. Despite the smaller number of returning salmon, more favorable water temperatures and improved disease control techniques resulted in higher survival of adults.

In the past, disease associated with warm temperatures during the fall took a high toll. Adult female losses at the Dexter collecting facility during the seven-year period between 1954 and 1960 ranged between 36 and 68 percent. The prespawning mortality of adult females was reduced to less than 7 percent during the last two seasons. (Oregon Fish Commission, March 25, 1963.)

* * * * *

NEARLY A MILLION YEARLING SILVER SALMON PLANTED IN ALSEA RIVER:

A total of 994,000 year-old silver salmon were released in the Alsea River in the first part of 1963 by the Oregon Fish Commission.



Silver Salmon

The young fish weighed 16 to the pound and averaged about 6 inches in length.

In earlier years, it was a common practice among fish culturists to release large numbers of fry shortly after hatching. But scientific investigation has indicated that rearing silver salmon to yearling migrant size leads to much higher survival rates.

A total of 6 million silver salmon eggs was taken at the Alsea Hatchery during the fall of 1962. The yield was well above the yearling rearing capacity of the station and helped supplement egg takes at other hatcheries. In

addition, 1,163 adult salmon were counted through the hatchery racks as they were allowed to pass upstream to spawn naturally. Large numbers of spawners also passed upstream uncounted during several periods of high water.

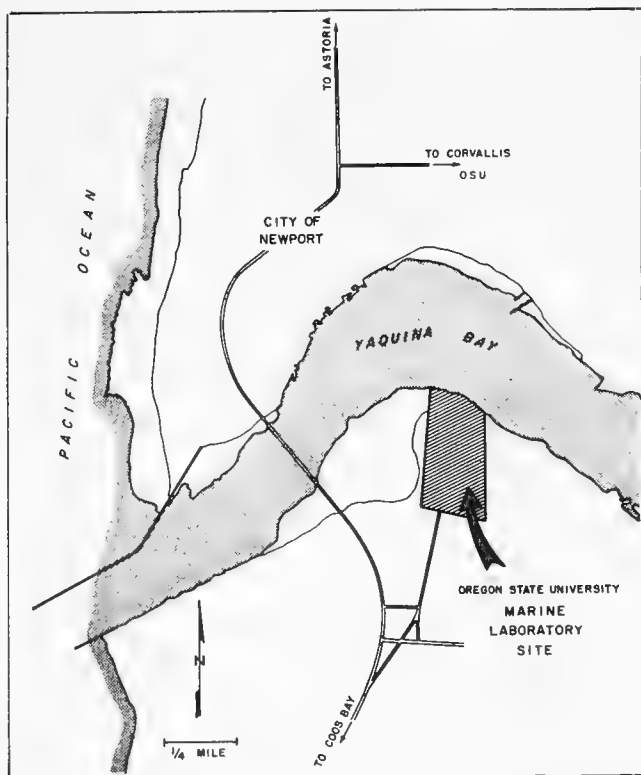
Since the liberation of 421,000 yearling silver salmon in 1961 formed the basis of last season's record Alsea run, the release in 1962 of 674,000 yearling silvers could mean an even heavier return during the fall of 1963.

The Alsea station appears to have contributed substantially to last year's good offshore silver salmon catch by commercial and sport fishermen, especially in the Newport-Waldport area. "This is an encouraging sign for the future indicating that, with modern fish cultural techniques, hatcheries can make a substantial contribution to the fishery," the Oregon Fish Commission's Director of Fish Culture said on April 1, 1963.

* * * * *

NEW MARINE SCIENCE LABORATORY WILL AID OCEANOGRAPHIC RESEARCH:

Construction is due to begin on the Marine Sciences Laboratory for Oregon State Uni-



versity. The laboratory will be located on Yaquina Bay just inside the harbor entrance. It will include docks and service facilities for the University's oceanographic vessels, and laboratory space and equipment for experimental work on marine organisms. There will also be a public aquarium and auditorium. The building, financed by a grant from the U. S. Area Redevelopment Administration, will be used by scientists in many phases of marine work, including oceanography.

Oceanographic work was begun at Oregon State in 1954 and expanded rapidly since the Department of Oceanography was formed in 1959. Research projects include studies of offshore water characteristics, currents and oceanic fronts; determination of bathymetry and analysis of sediments; inventories and ecological studies of marine life from bacteria to large fish and at all depths including the sea floor; chemistry and radio chemistry of sea water and marine organisms; and seismic and magnetic survey programs.

The early work was principally of a survey type. This phase is complete for some of the fields, as for example, the general study of physical and chemical properties and distributions of water masses. Papers on three aspects of this work are in preparation. Emphasis in physical oceanography is shifting to direct measurement of currents at all depths, the study of oceanic fronts, and examination of the effects of the weather, e.g. wind, on oceanic properties and circulation. The University will continue to sample a regular station pattern, however, to obtain data for time series studies.

Facilities in use include the R/V Acona, first vessel built for oceanographic research under the U. S. Navy's oceanographic research program. A four-story oceanography building will be built on the campus in Corvallis this year and is expected to be ready for occupancy by mid-1964. Most of the cost will be defrayed by a grant from the National Science Foundation, and about 25 percent of the funds will come from the State of Oregon.

The research program is accompanied and strengthened by graduate instruction. At present, 33 students are working toward graduate degrees in oceanography.

* * * * *

YEAR-OLD SILVER SALMON PLANTED IN COOS RIVER SYSTEM:

The release into the Coos River system of over 250,000 yearling silver salmon has climaxed the third year of activity at Millicoma Pond, the Oregon Fish Commission-Weyerhaeuser Company's cooperative salmon rearing impoundment in Coos County, the Commission's Director of Fish Culture reported on April 3, 1963.

Of the 262,000 yearling salmon reared in the eight-acre impoundment, 16,000 were transported by tank truck and released in upper South Coos tributaries. The balance of the fish were liberated into the East Fork of the Millicoma at the outlet of the pond. In May 1962, when the young silver salmon were placed in Millicoma Pond, they averaged about $2\frac{1}{2}$ -inches in length. At the time of release the average length was close to 6 inches.

Millicoma Pond is a production facility, a part of the Fish Commission's hatchery system. This is in contrast with Wahkeena Pond, located just off the Columbia River Highway near Multnomah Falls, which is an experimental facility designed to investigate the feasibility of rearing salmon to release size without supplemental feeding. At Millicoma, hatcherymen have been feeding the Oregon pellet, the nutritionally complete food ration developed some years ago through the cooperative efforts of the Fish Commission and Oregon State University scientists.

The yearlings just released will make their way to the ocean within the next few weeks. Not all will survive to make the return trip back upstream. Predators will take a toll and many other mishaps will thin the ranks during the ensuing months. Both sport fishermen and offshore commercial trollers harvest Coos system fish over a



considerable reach of the ocean. Some of the young silvers will spend only 7 or 8 months in the ocean before returning as jacks in the fall of 1963. Most of the survivors, however, will remain in the sea for 19 or 20 months to return as adults during the fall of 1964.



Preservation

ULTRAVIOLET RADIATION TO REDUCE BACTERIA IN REFRIGERATED SEA WATER TESTED:

Investigation of the effectiveness of two ultraviolet units designed for reducing the bacterial population in grossly contaminated liquid media is under way at the U. S. Bureau of Commercial Fisheries Technology Laboratory at Gloucester, Mass. One unit is a commercial unit and the other is an improvised unit. Both units are located at the Massachusetts Shellfish Treatment Plant in Newburyport.

Preliminary data on a refrigerated sea water sample collected after ultraviolet radiation treatment indicates a definite reduction of bacteria. Successful application of this technique could be of great importance to fishing vessels using refrigerated sea water for preservation of the catch. This is because the increasing bacterial content of the cold recirculating sea water sometimes results in a reduction of the quality of the fish.



Salmon

PACIFIC SALMON INTERAGENCY COUNCIL ORGANIZED:

High level fisheries officials in the Northwest met in Portland, Ore., on March 28, 1963, and formally organized the Pacific Salmon Interagency Council. The Council's objective is to appraise current and future plans, needs, programs, and results in the field of salmon management and to coordinate salmon research. The Council is composed of State and Federal fishery administrators with a major responsibility for the management or study of Pacific salmon. The Council was formed pursuant to recommendations from the second Governors' Conference on Pacific Salmon which was held January 1963 in Seattle, Wash.

During the Portland meeting, the Director of the Oregon Fish Commission was elected chairman of the Council for the coming year. The Pacific Regional Director of the U. S. Bureau of Commercial Fisheries at Seattle was named vice-chairman, and the Executive Secretary of the Pacific Marine Fisheries Commission was elected permanent secretary.

The Council's bylaws provide for a technical committee composed of one fisheries scientist from each member agency. The primary responsibility of the committee of scientists is to develop a comprehensive program to insure an optimum sustained yield from the salmon resources of the Pacific Coast. The technical committee was instructed to (1) review and evaluate the report of the Second Governors' Conference on Pacific Salmon, (2) evaluate existing data and programs for duplication or omission, (3) determine information needed on a priority basis, and (4) submit a written report to the council. The scientists planned to begin working on their assignment immediately.

The seven state organizations represented on the interagency council are the Alaska Department of Fish and Game, California Department of Fish and Game, Idaho Department of Fish and Game, Oregon Fish Commission, Oregon Game Commission, Washington Department of Fisheries, and Washington Department of Game. Federal agencies represented include the Office of the Commissioner, U. S. Fish and Wildlife Service; Bureau of Commercial Fisheries, Pacific Regional Office and Alaska Regional Office; Bureau of Sport Fisheries and Wildlife, Pacific Regional Office; and Corps of Engineers, North Pacific Division.

Note: See Commercial Fisheries Review, February 1962 p. 48.



Scallops

CANADIANS JOIN WITH NEW BEDFORD PRODUCERS IN PROMOTIONAL PROGRAM:

The New Bedford (Mass.) Seafood Council, promotional organization of the New Bedford sea scallop fishing fleet, has announced that the Canadian scallop industry has joined in its United States program of advertising and public information.

Negotiations for joint promotion in the United States have been under way since the spring of 1962. Canadian buyers and packers of scallops will be the contributors to the program which formerly has been supported solely by funds from New Bedford vessel owners and crews.

It is expected that the Canadian participation will add about \$15,000 to the Council's advertising budget for 1963. This will per-

mit expansion of the present program which involves an annual budget of approximately \$70,000. It will enable the Council to seek out markets heretofore unexplored and strengthen areas that have been underexploited for budgetary reasons.

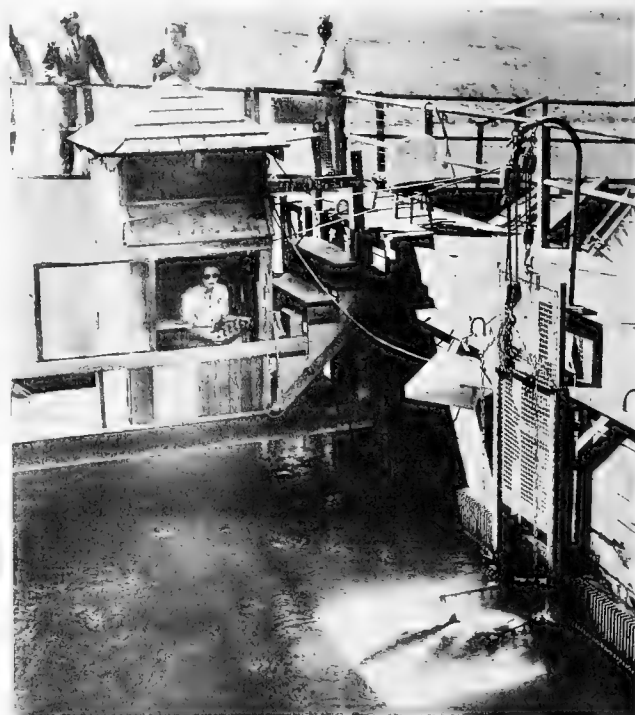
In the past few years imports of Canadian scallops have shown a sharp increase. In 1962, scallop imports from Nova Scotia dealers amounted to a new high of over 11 million pounds of scallop meats. New Bedford scallop vessels landed about 19 million pounds of scallop meats. The United States market was able to absorb both the domestic production and the Canadian imports at relatively profitable price levels.



Shad

COLUMBIA RIVER RUN INCREASES:

A total of 94,000 American shad was counted passing Bonneville Dam in 1960. The count jumped to 265,000 in 1961, and then to 417,000 in 1962, according to the Executive Director of the Pacific Marine Fisheries Commission. He suggested that the increasing size of the shad run in the mid-Columbia River may be due to ecological changes in the



Counting station on Bradford Island (on Columbia River) fish ladder.

river caused by the construction of The Dalles Dam. The bulk of the shad migration has been observed between the dams at Bonneville and The Dalles. No shad were counted over Rocky Reach Dam in 1962. The Washougal reef below Bonneville is a famous shad spawning area.

Shad were transplanted in western rivers from the East Coast. They migrate to the ocean and come back to spawn more than once. In the Sacramento River, which supports an active shad sport fishery, they reach a size of 24 inches and a weight of around six pounds.

SUSQUEHANNA RIVER STUDY PROPOSED:

A 2½-year study on the possibility of restoring shad runs in the Susquehanna River was proposed on April 4, 1963, by an administrative committee composed of representatives from the U. S. Fish and Wildlife Service and the States of Maryland, New York, and Pennsylvania. The suggested study, which was designed by a special technical committee, called for biological investigations to determine the advisability of constructing fishways at dams along the Susquehanna.

Features of the plan include hatching studies on 2 million shad eggs in 1963 and 1964. The eggs would be studied in floating hatching boxes at Falls on the North Branch of the Susquehanna River, at Sunbury and Clarks Ferry on the main river, and at Lewistown on the Juniata River, all in Pennsylvania. Research would include bioassays to determine the effects of environmental factors upon the early stages of shad development.

Some 50 million fertilized shad eggs from the Columbia River on the Pacific Coast would be planted in the Susquehanna River during the summer of 1963 and 1964 to provide young fish for studies of downstream migrations. Young shad spend their first summer in rivers and then migrate to sea in the fall. Stations would be set up at York Haven, Safe Harbor, Holtwood, and Conowingo dams to capture young shad and measure their downstream movement.

In another phase of the study, some 2,000 adult shad would be released above Conowingo and York Haven dams. Each year, 500 of the adult fish would be marked with

tags, including a recently developed sonic tag by which the movement of fish can be traced electronically. Fishermen who catch the adult tagged fish would be asked to report their catch so that the movement of the fish could be recorded.

Action to develop a means of financing the project was to be undertaken with the hope that actual work on the Susquehanna River could be started in April 1963. Biologists from Federal and State agencies would comprise the study force.

Development of the plan followed a 1962 study financed by the State of Pennsylvania that indicated it would be possible to design and construct a series of fishery structures at the power dams along the river which would allow upstream migration by shad and other fish species.

The possibility of redeveloping a run of shad on the Susquehanna has aroused considerable interest among fishermen and others, who recall the successful reestablishment of shad in the Connecticut River above Holyoke, Mass. State and Federal fishery biologists hope such a program could also be successful on the Susquehanna River, but evidence is yet insufficient to justify the substantial investment necessary to construct the fishways.

Although the earlier studies demonstrated the engineering feasibility of designing structures at the Susquehanna dams, additional data are needed about upstream conditions of the river, and whether a new shad fishery would survive and prosper.



Shrimp

UNITED STATES SUPPLY AND DISPOSITION, 1959-1962:

The available United States shrimp supply in 1962 was 11.2 percent greater than in 1961, but 1.5 percent below the supply in 1960. Although shrimp imports were at a record level in 1962, domestic landings were up only 9.2 percent from the low level of 1961.



Vessel unloading catch of shrimp at wharf.

U. S. Supply and Disposition of Shrimp, 1959-62

Item	2/1962	1/1961	1/1960	1/1959
..... (1,000 lbs.)				
Supply--Heads-on Weight:				
Domestic Landings.....	190,600	174,494	249,452	240,182
Foreign product of U. S. fisheries ^{3/}	716	-	-	-
Imports ^{4/}	240,738	213,957	189,431	177,610
Total supply (heads-on) ..	432,054	388,451	438,883	417,792
Disposition--Heads-on Weight (Approximate):				
Frozen:				
Headless ^{5/}	6/	238,901	278,535	247,649
Meat, raw (includes some cooked) ^{5/}	6/	81,107	76,933	53,805
Meat, cooked ^{5/}	6/	8,114	8,985	5,918
Breaded.....	6/	74,717	72,049	69,980
Specialties.....	6/	574	583	363
Total frozen ^{7/}	331,881	318,428	338,653	317,464
Canned.....	59,547	41,484	51,900	53,939
Dried.....	3,506	4,499	6,330	3,389
Fresh.....	30,000	24,000	42,000	43,000
Unclassified.....	7,120	40	-	-

1/Revised.

2/Preliminary.

3/Caught by domestic craft, principally in waters off Central America, and shipped to the United States. Reported by the U. S. Bureau of the Census as "Products of the American Fisheries."

4/The total quantity of all types of shrimp imports (fresh, frozen, cooked, dried, canned, etc.) was reported by the U. S. Bureau of the Census as follows: 1959--106,555; 1960--113,418; 1961--126,268; and 1962--141,384 pounds. The equivalent heads-on weight was computed.

5/May include some fresh products.

6/Not available.

7/The totals do not add and are less than actual totals because products frozen more than once have been eliminated.

Notes: (1) Shrimp data were compiled from figures assembled by the U. S. Tariff Commission and the Bureau of Commercial Fisheries. To convert the weight of heads-on shrimp to heads-off, divide by 1.68.

(2) See Commercial Fisheries Review, June 1962 p. 34.

UNITED STATES SHRIMP
SUPPLY INDICATORS, MARCH 1963:

Item and Period	1963	1962	1961	1960	1959
..... (1,000 Lbs., Heads-Off)					
Total landings, So. Atl. and Gulf States:					
May.....	-	6,151	5,276	6,335	6,885
April.....	-	3,349	3,171	4,728	3,595
March.....	3,700	3,317	4,754	4,099	2,950
February.....	3,920	4,125	3,910	3,784	3,227
January.....	4,000	3,828	5,686	5,402	4,308
January-December	-	105,100	91,396	141,035	130,660

Quantity canned, Gulf States 1/:

May.....	-	1,794	1,208	1,461	2,461
April.....	-	12	9	66	74
March.....	50	86	35	117	85
February.....	280	241	90	204	124
January.....	570	492	183	266	283
January-December	-	23,210	14,500	26,394	22,659

Frozen inventories (as of end of each mo.) 2/:

May 31.....	-	13,904	24,696	17,540	21,137
April 30.....	-	15,637	27,492	20,502	23,331
March 31.....	3/	16,607	31,345	23,232	24,893
February 28.....	4/ 27,597	19,012	37,612	29,063	27,555
January 31.....	4/ 28,487	21,328	37,842	34,332	30,858
January 1.....	31,577	19,755	40,913	37,866	32,844

Imports 5/:

May.....	-	11,221	8,278	9,902	8,264
April.....	-	10,219	9,208	7,733	9,051
March.....	3/	9,658	10,347	8,545	8,492
February.....	12,100	10,599	8,932	7,657	7,481
January.....	13,139	12,907	12,338	8,596	8,238
January-December	-	141,384	126,268	113,418	106,555

... (¢/lb., 26-30 Count, Heads-Off) ...
Ex-vessel price, all species, So. Atl. & Gulf Ports:

June.....	-	84.4	53.7	64.1	60.7
May.....	-	83.7	52.8	62.9	63.3
April.....	-	82.2	55.4	60.6	65.2
March.....	6/ 85-92	80.9	56.0	56.3	67.6
February.....	6/ 83-93	78.9	53.5	51.8	69.6
January.....	6/ 82-90	76.3	52.5	49.4	70.9

Wholesale price for froz. domestic brown species (5-lb. pkg.)
at Chicago, Ill.:

June.....	-	102-104	67-72	76-77	73-74
May.....	-	96-103	67-69	74-77	70-76
April.....	-	94-97	69-70	74-75	75-82
March.....	102-106	94-95	69-71	65-68	81-83
February.....	102-106	93-95	69-71	65-67	82-87
January.....	102-106	91-94	69-71	64-66	86-88

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).

2/Raw headless only; excludes breaded, peeled and deveined, etc.

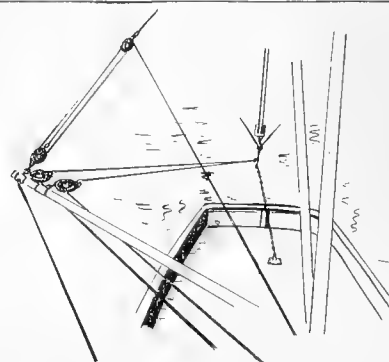
3/Not available.

4/Inventory of Jan. 31, 1963, includes 397,000 pounds and inventory of Feb. 28, 1963, includes 957,000 pounds for firms not reported previously.

5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

6/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only.

Note: Data for 1963 and 1962 are preliminary. March 1963 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



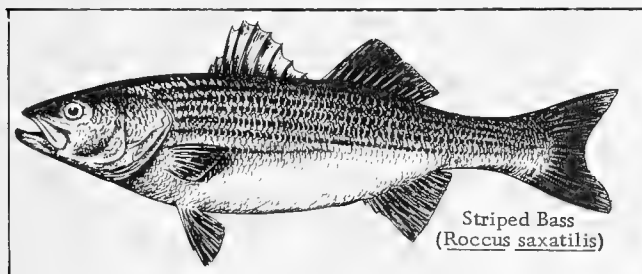
Striped Bass

TAGGING PROJECT HELPS ESTIMATE CHESAPEAKE BAY ABUNDANCE:

A total of 3,100 striped bass (rockfish) were tagged and released in Chesapeake Bay between Annapolis and Solomons, Md., during early January, 1963, in a joint study by the Maryland State Chesapeake Biological Laboratory at Solomons and the U. S. Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C. About 12 percent of the tagged fish had been recaptured by the end of February by cooperating fishermen. The returned tags will be useful in estimating the size of the rockfish supply in upper Chesapeake Bay during late winter.

The tagging program is part of a larger cooperative striped bass study designed to pinpoint the utilization, movements, and other aspects of the biology of the species during the rest of the year. This is the second year that biologists from the two agencies have worked closely in northern Chesapeake Bay.

State and Federal biologists began their estimation studies of striped bass populations in the Potomac estuary in 1959. They were continued during 1960 and 1961. The studies are limited to small fish that are 2 and 3 years old, because that group makes up most of the sports and commercial catch of striped bass. Numerical estimates of sublegal size fish and older fish larger than about 17 inches are not included. The Chesapeake Biological Laboratory has started a separate study to forecast hatches of striped bass by taking winter samples of the young fish.



The results of the population studies cannot be applied to management purposes as yet. Techniques are being subjected to further critical studies. The Director of the Maryland Natural Resources Institute said, "Attempts are being made to insure the ear-

liest possible application of these findings to the best management of striped bass in Maryland. Reliable knowledge of the number of striped bass present early in the fishing season is of enormous value to everyone. . . . It will contribute to wise decisions by management authorities on the quantity of fish which should be taken each year, and to the best distribution between netter and angler catch."



Swordfish

LONG-LINING OFF NEW ENGLAND SUCCESSFUL IN 1962:

The beginning of a new fishery to New England was indicated on August 13, 1962, when the large trawler Gulf Stream, operating out of Portland, Me., landed at Portland with 6 swordfish. It was the first swordfish ever caught by long line commercially and landed at a United States port. The vessel had also been harpooning and caught 35 swordfish by that method on the trip. On September 17, the same vessel landed 119 swordfish at Boston that were caught by long line. Shortly thereafter, the medium trawler Cap'n Bill III also began long-lining for swordfish, landing most of its catch at Woods Hole. By the end of 1962, those two vessels had made a total of 10 trips and landed 1,056 swordfish weighing 150,800 pounds (see table). About 366 tuna weighing 53,900 pounds were also caught by those vessels. The Cap'n Bill III continued fishing into January 1963.



Unloading dressed swordfish from long-liner Cap'n Bill III.

The vessel Gulf Stream made its first trips with the technical assistance of the U. S. Bureau of Commercial Fisheries Exploratory Base at Gloucester, and as a result of earlier explorations by Bureau scientists and the Woods Hole Oceanographic Institution. The Cap'n Bill III was chartered by the Woods Hole Oceanographic Institution on its first trip and also received technical assistance from the Bureau. A small trawler from Point Pleasant, N. J., also made a few long-line trips for swordfish which were landed at that port.

Swordfish and Tuna Long-Line Trips Landed at New England Ports, 1962 ^{1/}					
Date Landed	Port Landed	Swordfish		Tuna	
		No. Fish	1,000 Lbs.	No. Fish	1,000 Lbs.
Aug. 13 ^{2/}	Portland	8	1.8	-	-
Sept. 17	Boston	119	23.0	4	0.5
Oct. 16 ^{3/}	Woods Hole	17	3.4	32	4.2
Oct. 17	Portland	105	21.0	-	-
Nov. 1	Woods Hole	99	14.8	148	25.0
Nov. 15	Woods Hole	94	10.7	65	10.9
Dec. 2	Woods Hole	83	11.5	36	5.0
Dec. 4	Newport (R.I.)	88	13.0	37	3.9
Dec. 20	Woods Hole	366	36.6	44	4.4
Dec. 21	Portland	77	15.0	-	-
Total.		1,056	150.8	366	53.9
^{1/} Preliminary.					
^{2/} 35 additional swordfish caught by harpoon.					
^{3/} Experimental trip chartered by Woods Hole Oceanographic Institution.					

The normal swordfish season in the western North Atlantic extends from late June to early October when fishing is conducted by harpooning. Most of the harpooning is done on Georges Bank when swordfish are available during the warm weather. Long-lining allows vessels to follow the swordfish on their apparent southward migration to the edge of the Gulf Stream. The late-season trips in 1962 were made to that area.

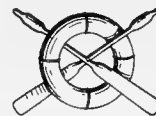
The long-line method of catching swordfish is not new. The Japanese have caught swordfish with long-line gear incidental to tuna long-line operations. The Cubans have had a long-line fishery for many years. Also, the Canadians in 1962 modified halibut long-line gear to fish swordfish on North Atlantic grounds. A Norwegian long-line trawler also caught swordfish on Georges Bank in 1962 while fishing for mackerel shark.

Most of the long-line caught swordfish was shipped and handled fresh on the Boston wholesale market. The appearance of fresh swordfish in November and December was completely new to dealers who would nor-

mally be handling only the frozen product at that time. Fresh swordfish moved at fairly high prices because the demand was very good.

Considerable interest in this new fishery has been indicated by vessel owners and dealers in New England. A number of vessels at New Bedford and Gloucester began outfitting with long-line gear, or planned to do so. How important the fishery will eventually become cannot be forecast at this time. Several key factors, such as the extent of the resource in the waters off the coast and the damage done by sharks during the summer, are largely unknown. Continued fishing in the immediate future will no doubt supply some of the answers.

-- John J. O'Brien
Supv. Market News Reporter
Fishery Market News Service
Boston, Mass.



Transportation

FISHERIES AND FARM ORGANIZATIONS SUPPORT REMOVAL OF BULK COMMODITY MINIMUM RATE REGULATIONS:

Twelve national organizations, representing a major portion of the nation's farmers, fishermen, and allied distribution industries have joined in support of the Administration's March 5, 1963, recommendation to Congress for removal of minimum rate regulations on the transportation of agricultural (includes fishery products) and bulk commodities. These organizations, however, voiced united opposition to the possible alternative, as referred to in the Administration's message, of applying regulation to all surface carriers in those areas presently exempt.

"Although there may be some honest differences in views as to the detailed safeguards that should be spelled out by Congress in adopting the minimum rate deregulation approach," the group's spokesman stated, "we have no differences in our policy positions that less regulation of railroads and not more regulation of motor and water carriers in these areas will promote a stronger national transportation system and be in the best interest of shippers and the public generally."

Experience has demonstrated that products from farms and fishery products cannot be

distributed to the consumers in the cities, towns, and rural areas throughout the country economically and efficiently under a system of Federal control.

"It is ironical that those modes of transportation which have made the greatest gains and progress in the past two decades under a regulatory policy which grants to those modes exemption from economic regulation in transporting agricultural and bulk commodities, now vigorously oppose extension to the railroads of a comparable freedom from regulation," the group's spokesman added. "This is an issue of grave concern to all of agriculture as well as to other shippers and the public generally and in our opposition to any narrowing or repeal of the agricultural or bulk commodities exemptions, we stand united." (United Fresh Fruit and Vegetable Association, Washington, D. C., March 20, 1963.)



Tuna

GOOD SKIPJACK TUNA SEASON FORECAST FOR HAWAII IN 1963:

A better than average 1963 summer catch of skipjack tuna in Hawaiian waters has been forecast by the U. S. Bureau of Commercial Fisheries Biological Laboratory in Honolulu.

The prediction of the availability of skipjack tuna to Hawaii's fishermen is based on the warming rate of the ocean's surface water in the spring. Oceanographic studies have indicated that the earlier in the year the ocean begins to warm up, the better will be the catch of skipjack in the ensuing summer fishing season.

This year, the waters off Koko Head on the Island of Oahu began to show a temperature upturn in the first part of February, one of the earliest changes on record. That development was checked against the seasonal change in the salt content of surface water. As this indicator also showed an early change, scientists are expecting a good year for the local tuna industry.

Knowledge of the life history of the skipjack tuna is still insufficient to enable oceanographers and biologists to explain exactly

why the relation between water temperature changes and the skipjack catch is so consistent. They have found, however, that the relation has held over the past 10 years, which is as long as suitable records of ocean temperature changes have been kept in Hawaii. It is thought that the skipjack schools move into the Hawaiian area with the seasonal movement of certain types of central Pacific waters, such as the boundary between the California current extension and the north Pacific central water.

Although the ability to predict catches is one of the major goals of fishery science, dependable forecasting techniques are still to be worked out for most of the world's fisheries. It is not yet possible to predict with certainty the exact level of Hawaiian skipjack landings, but there is a considerable practical value in even a general pre-season forecast. Such knowledge enables processors and distributors to regulate their alternate sources of raw material and to buy appropriate supplies. It also lets the fishermen know in advance what sort of return may be expected from their investment in fishing gear and equipment.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, FEBRUARY 1963:

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, February 1963 with Comparisons

Area (Home Port)	Feb.		Jan.-Feb.		Total
	1963	1962	1963	1962	
..... (Number)					
<u>Issued first documents 2/:</u>					
New England	2	-	3	2	28
Middle Atlantic	-	-	1	-	3
Chesapeake	3	2	3	6	43
South Atlantic	5	2	7	4	47
Gulf	11	5	23	15	110
Pacific	5	6	9	12	130
Great Lakes	-	-	-	-	5
Puerto Rico	-	-	-	-	2
Total	26	15	46	39	368
<u>Removed from documentation 3/:</u>					
New England	1	3	2	5	24
Middle Atlantic	6	1	10	9	39
Chesapeake	2	1	3	3	23
South Atlantic	3	4	10	7	38
Gulf	5	6	10	19	104
Pacific	8	11	15	27	111
Great Lakes	-	1	2	6	22
Hawaii	-	-	-	1	3
Puerto Rico	-	-	-	-	1
Total	25	27	52	77	365
1/For explanation of footnotes, see table 2.					

1/For explanation of footnotes, see table 2.

During February 1963, a total of 26 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 15 in February 1962. There were 25 documents cancelled for fishing vessels in February 1963 as compared with 27 in February 1962.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, February 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	..... (Number)	
5-9	6	7
10-19	9	6
20-29	-	3
30-39	1	5
40-49	1	1
50-59	-	1
60-69	1	-
70-79	2	-
80-89	1	-
100-109	-	1
110-119	1	-
140-149	4	-
190-199	-	1
Total	26	25
1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.		
2/Includes 1 redocumented vessel in February 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 7 in 1963; 7 in 1962; 1 in 1961; 2 in 1960, and 9 prior to 1951.		
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.		
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.		

* * * * *

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JANUARY 1-MARCH 31, 1963:

From the beginning of the program in 1956 through March 31, 1963, a total of 1,249 applications for \$34,341,496 have been received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total 657 (\$15,305,654), have been approved, 459 (\$11,982,700) have been declined or found ineligible, 142 (\$5,936,599) have been withdrawn by applicants before being processed, and 20 (\$320,870) are pending. Of the applications approved, 263 (\$1,641,317) were approved for amounts less than applied for.

The following loans were approved from January 1, 1963, through March 31, 1963:

New England Area: Boat Pelican, Inc., New Bedford, Mass., \$23,513;

South Atlantic and Gulf Area: Pete Smirch, Freeport, Texas, \$19,647;

California: Glenn A. McCune, Crescent City, \$20,000; Douglas N. Fearon, Cupertino,

\$20,000; Leo Leroux, San Pedro, \$9,030; Donald R. Pache, Smith River, \$3,000;

Pacific Northwest Area: Ben F. Jones, Newport, Oregon, \$8,200; Ole I. Olson, Seattle, Wash., \$7,000;

Alaska: Thomas W. Maloney, Auke Bay, \$6,600; Erling O. Broderson, Homer, \$40,000; Philip C. Leshner, \$22,000; Donald A. Davis, Ketchikan, \$4,015.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the first quarter of 1963, 9 applications to insure mortgages for \$305,015 were received and commitments to insure mortgages in the amount of \$140,865 on 3 fishing vessels were approved. Since the start of this program (June 5, 1960), 23 applications were received for \$1,853,611. Of the total, 15 applications have been approved for \$1,798,096. Approval of 8 applications for \$55,515 is pending. Since the Mortgage Insurance Program began, applications received and approved by area were:

New England Area: Received 9 (762,490), approved 7 (\$622,490);

California: Received and approved 1 (\$557,000);

South Atlantic and Gulf Area: Received 9 (\$326,575), approved 3 (\$111,060);

Pacific Northwest Area: Received and approved 4 (\$507,546).

In the Construction Differential Subsidy Program, no applications were received during the first quarter of 1963. One pending differential subsidy payment to Stagan Corporation for about \$51,700 was approved during the quarter. The first approval in this program was made in March 1961. The amount approved for subsidy represents about one-third the cost of a new vessel. Since the beginning of the program on June 12, 1960, 9 applications (excludes several ineligible applications) were received for \$698,325, of which 6 applications were approved for \$547,658. Approval of 3 applications for about \$150,667 under this program is pending.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JANUARY 1963:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in January 1963 were up 0.1 percent in quantity, but down 10.9 percent in value from those in the previous month. Imports were up in January for fish blocks and slabs, groundfish fillets, frozen tuna other than albacore (increase mostly from Peru and British West Africa), swordfish fillets, yellow pike fillets, frozen salmon, canned crab meat, and sea scallops. But there was a decline in imports of most other fishery products. Imports of frozen albacore tuna dropped to a very low level in January and imports were also down substantially for canned tuna in brine, canned sardines in oil and not in oil, lobsters from Canada, and frozen shrimp (decline mostly from Mexico).



Compared with the same month in 1962, the imports in January 1963 were down 2.7 percent in quantity and 13.4 percent in value. There was a sizable decline this January in imports of canned salmon, frozen albacore tuna, canned tuna in brine, canned sardines in oil, canned oysters, and frozen spiny lobster tails (decline mostly from South Africa). The decline was offset partly by a large increase in imports of frozen tuna other than albacore, and fish blocks and slabs.

U. S. Imports and Exports of Edible Fishery Products, January 1963 with Comparisons						
Item	Quantity			Value		
	Jan. 1963	1962	Year 1962	Jan. 1963	1962	Year 1962
	.. (Millions of Lbs.)			.. (Million of \$)		
Imports:						
Fish & Shellfish:						
Fresh, froz. & processed ¹ ..	86.6	89.0	1,169.7	27.9	32.2	397.4
Exports:						
Fish & Shellfish:						
Processed only ¹ (excluding fresh & frozen) . . .	3.7	3.5	35.6	1.6	1.4	16.0
¹ /Includes pastes, sauces, clam chowder and juice, and other specialties.						

Exports of processed fish and shellfish from the United States in January 1963 were down 22.9 percent in quantity and 23.8 percent in value from those in the previous month. There was a sharp drop in January in exports of canned sardines not in oil and exports were also down for canned shrimp and canned mackerel. The decline was offset partly by a modest increase in exports of canned salmon and canned squid.

Compared with the same month in 1962, the exports in January 1963 were up 5.7 percent in quantity and 14.3 percent in value. There was a big increase in exports of canned salmon

this January, but there was a substantial decline in exports of canned mackerel.

* * * * *

IMPORTS OF TUNA CANNED IN BRINE UNDER QUOTA PROVISIO FOR 1963:

The quantity of tuna canned in brine which may be imported into the United States during calendar year 1963 at the 12½ percent rate of duty is limited to 63,130,642 pounds (or about 3,006,221 standard cases of 48 7-oz. cans). This is 6.9 percent more than the 59,059,014 pounds (about 2,812,000 standard cases) in 1962, 10.5 percent more than the 57,114,714

pounds in 1961, 18.1 percent more than the 53,448,330 pounds in 1960, 20.5 percent more than the 52,372,574 pounds in 1959, 41.2 percent more than the 44,693,874-pound quota for 1958, and 38.9 percent more than the 45,460,000-pound quota for 1957. Any imports in excess of the 1963 quota will be dutiable at 25 percent ad valorem.

Any tuna classifiable under the Tariff Act of 1930, as amended, paragraph 718(b)--fish, prepared or preserved in any manner, when packed in airtight containers. . . (except fish packed in oil or in oil and other substances; . . .)--which is entered, or withdrawn, for consumption is included.

A proclamation (No. 3128), issued by the President on March 16, 1956, gave effect to an exchange of notes with the Government of Iceland to withdraw tuna canned in brine from the 1943 trade agreement and invoked the right to increase the duty reserved by the United States in negotiations with Japan and other countries under the General Agreement on Tariffs and Trade. The quota is based on 20 percent of the previous year's United States pack of canned tuna.

The 1963 tariff-rate quota was published in the April 17, 1963, Federal Register by the

Bureau of Customs of the U. S. Department of the Treasury.

Note: Pounds converted to cases at 21 pounds equal 1 standard case of 48 7-oz. cans.

* * * * *

IMPORTS AND EXPORTS OF FISHERY PRODUCTS, 1962:

In 1962, about 47 percent of the United States supply of fishery products was obtained from foreign countries, according to preliminary data. Imports were at record levels for such products as groundfish fillets and blocks, shrimp, sea scallops, spiny lobsters, frozen tuna, tuna loins, canned oysters, and fish meal.

Table 1 - U. S. Imports of Selected Fishery Products, 1961 and 1962

Commodity	1962	1961	Percentage Change from 1961 to 1962	
			In-crease	De-crease
	.. (1,000 Lbs.) ..			
Groundfish and ocean perch:				
Fillets.	77,907	76,490	2	-
Blocks and slabs.	143,539	118,609	21	-
Total	221,446	195,099	14	-
Fillets, other than groundfish:				
Flounder	18,442	18,420	-	-
Fresh-water fish.	10,672	9,840	8	-
Other.	21,450	27,974	-	23
Swordfish, incl. steaks & chunks	19,644	19,033	3	-
Tuna, fresh or frozen:				
Albacore.	83,940	71,945	17	-
Other than albacore	188,525	125,182	51	-
Total.	272,465	197,127	38	-
Tuna loins and discs	10,522	8,348	26	-
Tuna, canned in brine:				
Albacore.	27,836	29,116	-	4
Other than albacore	28,526	29,116	-	2
Total.	56,362	58,232	-	3
Tuna, canned in oil	358	431	-	17
Bonito and yellowtail, canned	6,128	6,853	-	11
Crabmeat, canned.	3,506	4,237	-	17
Lobster, fresh or frozen:				
Northern.	22,102	21,299	4	-
Spiny.	35,948	32,610	10	-
Lobster and spiny lobster, canned.	3,309	2,828	17	-
Oysters and oyster juice, mostly canned.	7,828	7,701	2	-
Salmon:				
Fresh or frozen.	9,735	12,309	-	21
Canned.	6,844	7,167	-	5
Sardines:				
Canned in oil	32,613	27,877	17	-
Canned not in oil	17,317	14,611	19	-
Sea scallops, fresh or frozen	11,564	8,652	34	-
Frog legs, fresh or frozen .	2,598	2,089	24	-
Shrimp, mostly frozen, some canned and dried .	141,384	126,268	12	-
	.. (Tons) ..			
Fish Meal.	252,307	217,845	16	-
Fish Solubles	6,308	6,739	-	6

During 1962, United States exports of fishery products showed some recovery from the low levels of 1961.

Table 2 - U. S. Exports of Selected Fishery Products, 1961 and 1962

Commodity	1962	1961	Percentage Change from 1961 to 1962	
			In-crease	De-crease
Misc. fish, mostly fresh-water, fresh or frozen.	13,957	3,608	287	-
Oysters, shucked.	411	579	-	29
Salmon:				
Fresh or frozen.	1,507	1,094	38	-
Canned.	8,978	7,186	25	-
Mackerel, canned.	4,271	3,908	9	-
Misc., canned fish, mostly Calif. anchovies.	531	454	17	-
Sardines:				
Canned not in oil.	7,188	7,475	-	4
Canned in oil.	578	185	212	-
Shrimp^{1/}:				
Fresh or frozen.	3,457	4,771	-	28
Canned.	2,212	2,503	-	12
Squid, canned.	7,785	3,432	127	-
Whale and sperm oil.	2,697	1,208	123	-
Fish oils.	123,050	122,486	1	-

^{1/}Does not include re-exports of Mexican shrimp.

Note: See Commercial Fisheries Review, May 1962 p. 35.



Vessel Equipment

FIRM TO BUILD AND SELL CONTROLLABLE PITCH PROPELLER:

A corporation with research and development offices in Wilmington, Mass., has obtained an exclusive license to build and sell a controllable pitch marine propeller which was designed by a marine products firm in Warren, R.I. In a statement announcing the license on February 19, 1963, an official of the corporation said his company was interested in new applications of the propeller for hydrofoils and other high-speed craft, as well as large ocean-going vessels, research vessels, fishing vessels, and tugboats.

The controllable pitch propeller, which is one of a few that are designed and built in the United States, has been used at sea in various vessels for more than two years. It was installed on the Gosnold, an oceanographic ship of the Woods Hole Oceanographic Institution, and the Narragansett, the first United States automated stern trawler.



Virginia

ELECTRONIC COMPUTER SPEEDS RESEARCH AT MARINE LABORATORY:

The purchase of a transistorized analog computer for use in marine research projects was announced by the Virginia Institute of Marine Science on April 5, 1963. The Director of the Institute said, "Although this is a relatively small model, compared to computers used by large industries and Federal agencies, it represents a step forward in providing better up-to-date tools for marine research. Such devices can hasten considerably the development of various research projects."

The computer has been put to work on plankton studies sponsored by the Office of Naval Research. Its application is to stimulate behavior of natural plankton systems through the use of mathematical models. In this manner, it will be possible to formulate and test theories of the basic productivity of plankton.

The scientist in charge of plankton research pointed out that the computer can also be used in other research projects at the Institute, including studies of water mass movements, waves, beach erosion, and population dynamics of selected marine organisms. It can be applied whenever a scientist can formulate a mathematical model of his research problem which employs differential equations.



Washington

VESSEL REDUCTION IN PUGET SOUND SALMON FISHERY RECOMMENDED:

Serious misuse of two of Washington State's more important resources--salmon and manpower--has turned the once-dynamic Puget Sound salmon fishery into an industry with continuing conservation and grave economic problems. Despite some salmon runs of near-record size, the inland sea's commercial fisherman is going broke. His net income, according to a recent University of Washington study, averages considerably less than \$2,000 a year and in many instances, such as in purse-seine fishing, it is impossible for him to earn even one-half of the average income received by all Washington State residents. In addition, an increased fishing effort on the Puget Sound salmon runs has presented serious conservation problems. More and more fishermen, using more efficient gear and fishing over an expanded area are threatening to deplete the fish stocks entirely.

In April, 1962, the University of Washington's Fisheries Research Institute was asked by the State Legislative Interim Fisheries Committee to find out not only

why incomes were depressed, but to make recommendations to correct both the economic and conservation problems. In an unusual interdisciplinary study, Dr. Gerald J. Paulik and Dr. Donald E. Bevan of the Research Institute joined with Dr. James Crutchfield of economics and Prof. Robert L. Fletcher of law, to provide a biostatistical, economic, and legal analysis of the Puget Sound salmon industry. Dr. William F. Royce of the Fisheries Research Institute was in charge of the project.

Among their findings, the University study group concluded that the biggest problem in the fishery was overdevelopment and recommended that the present fleet be cut by one-third. Basing their recommendation upon statistical studies, the researchers pointed out that in 1945, slightly more than 1,500 units of fishing gear were employed to harvest 52 million pounds of salmon. In 1961, nearly three times that amount of gear was used to harvest only 30 million pounds of salmon. "Over the past 15 years we have been using more and more fishing effort to catch fewer and fewer fish," said Dr. Crutchfield. "By any standard--physical or economic--this is inefficient."

To achieve the fleet reduction, the University study group recommended that the number of commercial fishing licenses presently issued be frozen to enable the weeding out of licenses for vessels which have not fished for salmon within the past few years. Then, the researchers continued, license fees should be raised to levels bearing a more realistic relationship to the value of the fishing privilege conferred. The University study also recommended that the license revenues be used in a revolving fund to permit the State to buy out some of the fishermen (at the fisherman's option) and take their gear out of service. Those recommendations and others proposed by the Research Institute are now being studied by the Legislative Committee as well as representatives of the fishing industry. It is expected that legislation will be drafted and submitted to the State Legislature before the end of this session.

"The general reaction to the study has been favorable," said Dr. Royce, project coordinator. "Of course people in each group have some reservations until they see how it will affect their particular interests. No one questions the need for a fleet reduction. It is a question now of who will be cut." Dr. Crutchfield commented further: "The basic issue is not how, but who shall harvest the fishery. No one has any responsibility for, or ability to, reduce and as long as anyone is free to enter the fishery whenever he wants, there is no reason for any one unit to reduce. The situation, therefore, is not self-corrective. Under any method of calculation we are wasting from \$1 to \$4 million a year by having too many men and ships tied up."

Puget Sound fishermen, using purse seine, gill net and reef net gear, harvest primarily the sockeye and pink salmon runs from the outer San Juan Straits, through the Puget Sound waters, to the Fraser River in British Columbia. These runs are under the regulation of the International Pacific Salmon Commission which provides for equal catches by Canadian and United States fisheries. In previous years, in order to preserve the fish stock, the Commission adopted regulations limiting the size of fishing vessels, prohibiting the use of certain gear and either closing or greatly reducing fishing in major areas.

Conservation has been achieved by gross reductions in fleet efficiency, which is hardly the most economical

way of running a business as Dr. Crutchfield pointed out in his economic analysis. "Conservation is more than fish biology," he said. "It also involves people--those who catch the fish and those who eat them. Regulations which have the effect of reducing economic efficiency are wasteful. No business would think of operating in this manner."

The question now before members of the Legislative Committee is whether or not the fleet reduction would work, and if it did, would it be legal? Using factors determined from recent fishing data collected by the Washington State Department of Fisheries, Drs. Paulik and Bevan translated approximately 1,000 mathematical equations into instructions to simulate salmon runs, fishing activity and the catch under various conditions on the University's IBM 709 computer. From these studies, the researchers concluded that even with a one-third reduction in the fishing fleet, the fishery would still harvest even large salmon runs without approaching the exploitation limits of the present gear. Even with a 50 percent fleet cut, all but the very large and unexpected salmon runs could be harvested.

Dr. Crutchfield conservatively estimated that a one-third reduction in gear would save from \$700,000 to more than \$2.5 million depending upon the size of the run and the ability of the fleet to harvest it. A 50-percent cut, he added, would yield savings from \$1 to \$4 million. In addition, the fleet reductions would (1) increase individual unit efficiency, (2) enable the Commission to relax some of the restrictions on gear efficiency, (3) minimize the risk of loss from breakdown, (4) improve the quality of the end product by spreading out deliveries to packers over a 4- or 5-day week and (5) extend the fishing week to 4 or 5 days which would improve the management problem.

The scientist explained that at the present time the Commission relies upon the fishermen for information as to size of runs, timing, etc. Under present regulations it is difficult to know what is occurring in the Puget Sound waters during the closed period. "Even in one day of fishing, the present fleet is capable of catching dangerously large proportions of the given number of salmon. The longer the fishing week, the greater the range and accuracy of information reaching the Commission and the more accurate its regulatory techniques can be made."

Will a legislative provision restricting the number of commercial fishermen in a major portion of the State's salmon fishery be constitutionally valid? In the opinion of Professor Fletcher, who conducted the legal studies for the University survey, the answer is "yes." He said "In the early history of the United States Supreme Court, such a scheme perhaps would have been held unconstitutional as some sort of unwarranted deprivation of property or liberty, or possibly as some sort of discriminatory denial of equal opportunity to pursue gainful employment. In modern times, however, the Supreme Court is most tolerant of legislative judgements of economic matters."

Any kind of legislation will stand the tests of constitutionality, he said, if it has these minimum requirements: (1) a rational determination that some benefit to the general welfare of the people will be served by the legislation; (2) it is founded upon some basis of fact; and (3) it includes a rational choice of means to accomplish the objective.

"No one would quarrel with the proposition that the wise use of a natural resource is a matter of utmost concern to the legislature and the people," said Dr. Fletcher. "So far we have not attributed to the fishing grounds the same incidents of area control that we do in the case of ordinary land ownership."

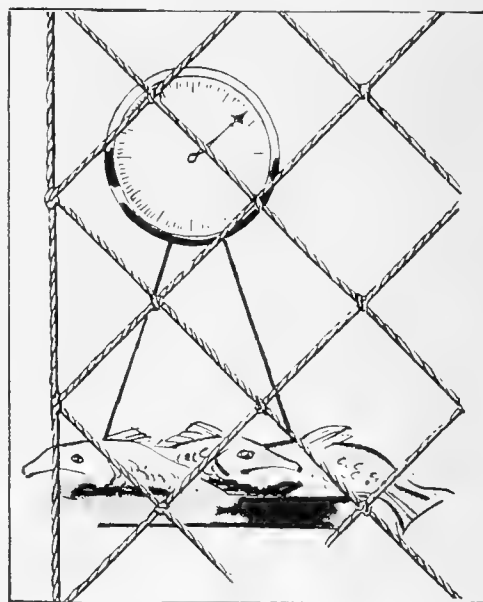
One of the important principles behind the University's Puget Sound Salmon Survey is the introduction of an entirely new concept in the fisheries industry--that economic efficiency is an important criteria for regulatory policies.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, MARCH 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in March this year dropped slightly (0.9 percent) from February 1963 due primarily to lower ex-vessel prices for fresh drawn haddock and lower wholesale prices for fresh haddock fillets, frozen dressed halibut and salmon, fresh



shrimp, and canned Maine sardines. Compared with the same month a year ago, wholesale prices for fishery products this March were lower by 2.5 percent due mainly to lower prices for fresh dressed and filleted haddock, a smaller drop in prices for frozen flounder and ocean perch fillets, and generally lower prices for canned fish products.

The drawn, dressed, and whole finfish subgroup index in March 1963 was down 1.2 per-

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, March 1963 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Mar. 1963	Feb. 1963	Mar. 1963	Feb. 1963	Jan. 1963	Mar. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					117.3	118.4	121.9	120.3
<u>Fresh & Frozen Fishery Products:</u>					123.0	124.4	130.0	119.4
<u>Drawn, Dressed, or Whole Finfish:</u>					121.2	122.7	137.2	121.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.12	91.9	94.6	162.9	124.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.41	.43	122.2	125.6	128.1	116.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.95	.96	132.7	133.8	134.5	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.68	.68	100.7	100.7	106.0	111.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.69	.69	113.0	113.0	88.5	120.4
<u>Processed, Fresh (Fish & Shellfish):</u>					125.5	128.5	130.4	123.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.39	.41	94.7	98.3	137.2	121.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.07	1.12	125.4	130.7	127.2	117.2
Oysters, shucked, standards	Norfolk	gal.	7.75	7.75	130.7	130.7	132.8	130.7
<u>Processed, Frozen (Fish & Shellfish):</u>					117.3	117.3	117.5	109.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	97.6	98.9	100.1	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	108.5	108.5	107.0	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.33	117.5	115.7	117.5	119.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.04	1.04	123.4	123.4	123.9	112.1
<u>Canned Fishery Products:</u>					107.7	108.0	108.0	122.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.75	24.75	107.9	107.9	107.9	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.90	5.90	2/100.0	2/100.0	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.06	9.31	116.2	119.4	119.4	164.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced in the fishery products index by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/Based on Calif. sardines and not directly comparable with new subgroup item (jack mackerel) for January-March 1963.

cent from a month earlier, and dropped about 0.5 percent from March a year ago. Lower ex-vessel prices at Boston for fresh drawn haddock (down 2.9 percent), plus further declines in wholesale prices for frozen dressed halibut and salmon were responsible for the decrease from February to March this year. From March a year ago to March this year, a decrease of 25.9 percent in the drawn fresh haddock price and lower prices for the fresh-water varieties were just about cancelled out by higher prices for frozen salmon and halibut.

The fresh processed fish and shellfish subgroup index this March decreased 2.3 percent from a month earlier but was up 1.9 percent from March 1962. From February to March this year, prices were lower for fresh haddock fillets at Boston (down 3.7 percent) and fresh shrimp at New York City (down 4.1 percent). The fresh shucked oyster price was unchanged from February to March 1963 and remained at the same level as March a year ago. As compared with March 1962, fresh haddock fillets this March were down 22.0 percent, but fresh shrimp prices were higher by 7.0 percent.

The March 1963 processed frozen fish and shellfish subgroup price index was unchanged from the preceding month but was up 7.6 percent from the same month of 1962. From mid-February to mid-March this year, prices for frozen flounder fillets dropped 1.3 percent but frozen ocean perch fillets were higher by 1.6 percent. Compared with the same month a year ago, the March 1963 subgroup index was up because of higher frozen shrimp prices at Chicago (up 10.1 percent) and an increase of 7.3 percent in the frozen haddock fillet price. As compared with March last year, prices for frozen flounder and ocean perch fillets were slightly lower.

The canned fishery products subgroup index from February to March 1963 dropped slightly (0.3 percent) due to lower prices for canned Maine sardines. From March a year ago to this March, the subgroup index dropped 11.8 percent because of a sharply lower canned Maine sardine price (down 29.3 percent), a lower canned pink salmon price (down 13.1 percent), and a 3.2 percent drop in the canned tuna price.





FOREIGN

International

EUROPEAN FREE TRADE ASSOCIATION

DENMARK AND NORWAY CONFER ON TARIFF REDUCTION:

Bilateral talks between Denmark and Norway were held in Oslo, Norway, during the latter part of March 1963, to discuss proposals to accelerate the reduction of internal tariffs between the seven member countries of the European Free Trade Association (EFTA). Norway is interested in concessions on fish and fish products, and Denmark is concerned about tariffs on its agricultural products. Final discussions between the two countries were to be held at the Nordic Foreign Ministers Meeting in Oslo, April 26, prior to the EFTA Council Meeting in May 1963.

The Norwegian Commerce Minister observed that when EFTA was established in 1959, Norway felt there was a reasonable balance between the interests of the Member countries. A 10-year program was then adopted for liquidation of internal tariffs on industrial goods. Current proposals to remove those tariffs by 1966, he maintained, were chiefly in the interest of the most advanced industrial EFTA nations. Norway and Denmark, which are not particularly interested in accelerating the tariff reductions, would naturally demand concessions in other fields in order to maintain the original balance of interests, he declared. (News of Norway, April 4, 1963.)

FISH MEAL

FISH MEAL PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-DECEMBER 1962:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

In 1962, Peru accounted for 74.9 percent of total fish meal exports by FEO countries, followed by South Africa

Production and Exports of Fish Meal by Member Countries of the Fish Meal Exporters' Organization, Jan.-Dec. 1962

Country	1962			
	December	Jan.-Dec.	December	Jan.-Dec.
	Production	Exports	Production	Exports
	..... (Metric Tons)			
Angola	3,717	3,895	32,758	32,558
Iceland	2,167	7,498	96,147	70,931
Norway	4,557	10,387	120,927	61,690
Peru	155,915	107,621	1,120,796	1,065,952
South Africa (incl. S. W. Africa)	-	11,290	201,219	192,931
Total	166,356	140,691	1,571,847	1,424,062

with 13.5 percent, Iceland with 5.0 percent, Norway with 4.3 percent, and Angola with 2.3 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 6, 1963.)

* * * * *

WORLD PRODUCTION, JANUARY 1963:

World production of fish meal in January 1963 was 48.2 percent greater than in the same month of 1962, according to preliminary data from the International Association of Fish Meal Manufacturers. World production during the year 1962 was reported as 2,199,465 metric tons.

Most of the principal countries producing fish meal submit data to the Association monthly (table).

World Fish Meal Production by Countries, January 1963			
Country	January		Jan.-Dec.
	1963	1962	1962
	.... (Metric Tons)		
Canada	7,516	14,442	79,371
Denmark	6,118	3,225	91,110
France	1,100	1,100	13,200
German Federal Republic ..	5,975	5,611	72,442
Netherlands	1/	1/	2/ 4,600
Spain	2,085	1,914	25,499
Sweden	444	698	5,000
United Kingdom	6,443	5,751	74,184
United States	2,072	2,478	3/261,521
Angola	2,956	3,278	32,767
Iceland	9,476	1,421	96,147
Norway	3,659	4,081	120,924
Peru	145,659	78,979	1,121,096
South Africa (including South- West Africa)	10,522	14,700	3/201,604
Total	204,025	137,678	2,199,465

1/ Data not available.

2/ Data available only for January-November 1962.

3/ Revised.

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

International (Contd.):

The increase in world fish meal production in January 1963 was due mainly to greater output in Peru, which accounted for 71.4 percent of the total production during the month.

World fish meal production during 1962 was increased by heavier landings of anchoveta in Peru, record landings of pilchards in South Africa, record landings of summer herring in Norway and Iceland, and increased landings of industrial fish in Denmark.

In 1962, Peru accounted for 51.0 percent of total fish meal production, followed by the United States with 11.9 percent and South Africa with 9.2 percent.

GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

HOLDS SEVENTH SESSION IN MADRID:

The General Fisheries Council for the Mediterranean was scheduled to hold its 7th session in Madrid, March 12-18, 1963. About 70 participants from the Council's 13 member nations were due to attend the meeting which was sponsored by the Food and Agriculture Organization (FAO).

Among other topics to be discussed at the meeting were the marine resources of the Mediterranean, present trawling grounds, Mediterranean fishing boats, gear and methods, light fishing, echo sounders, preservation of fishery products, water pollution, and fishing and fish culture in inland waters.

The Council meeting was to be followed by a visit to the fishing harbor of Vigo in north-west Spain.

NORTHWEST PACIFIC FISHERIES COMMISSION

SOVIET-JAPANESE FISHERY MEETING IN TOKYO:

The Seventh Annual Meeting of the International Northwest Pacific Fisheries Commission (Japan and Russia) opened March 4, 1963, at Tokyo. The outgoing Soviet Chairman, in calling the Conference to order, stated he was confident the meeting would reach a satisfactory conclusion. The Japanese Minister of Agriculture and Forestry, in a welcoming address remarked that the Government of Japan has endeavored through conservation measures to maintain the productivity of the fisheries resource for the fishing industry. He hoped that the Conference, basing its findings on scientific data, would reach an amicable decision on the conservation of the resources and not drag on too long.

The agenda contained 22 items, the most important of which were: (1) condition of the salmon and salmon-trout resources in the Convention area; (2) discussion of the total annual catch of salmon and salmon-trout and necessary measures to restrict fishing operations; (3) condition of the crab resources and necessary measures for restricting operations; and (4) procedures for controlling fishing operations in the Convention area.

Under agenda item (4), it was rumored the Soviets proposed sending their patrol vessels to enforce fisheries regulations of the Commission in Area B, which is south of 45° N. latitude. Such a move will be resisted strongly by the Japanese since they consider that area part of the Convention waters. But having permitted the boarding of Soviet inspectors on Japanese patrol vessels in the area during the 1962 season, the Japanese may find it hard to block this proposal.

The Japanese Fishery Agency believed the length of the conference would depend on (1) Soviet determination to enforce fisheries regulations in Area B, and (2) Soviet resistance to Japanese demands for a 10-percent increase in the salmon catch quota for the mothership fishing area (Area A). The salmon catch quota for that area in 1962 was 55,000 metric tons. At the 1962 conference it was reported that the Japanese Minister of Agriculture and Forestry, and Soviet Minister of Fisheries, verbally agreed that the salmon catch quota in Area A for the 1963 season would be increased 10 percent. However, in a press interview, one of the Soviet Commissioners commented that the question of this 10-percent increase should be settled only after full discussions by the Scientific and Technological Subcommittee. As for the Japanese catch quota in Area B (60,000 tons in 1962), it was agreed in writing last year that the 1962 quota would be increased 10 percent in 1963.

The two controversial issues appeared to be the 1963 quota in Area A and the Soviet enforcement of the regulations in Area B. Another rumor indicated that if negotiations became deadlocked, a settlement on a political basis would be worked out by the Japanese and Russian Ministers.

On the third day of the conference as many as 13 agenda topics were considered and finished and a recommendation to the respective Governments was raised so that in 1963 viola-

International (Contd.):

tion of rules and agreements by fishing vessels should be eliminated. Violations by Japanese vessels were much more numerous than Soviet vessels in 1962.

Discussions at the Science Subcommittee began on March 7 with the evaluation of pink salmon resources. On March 8, an exchange of reports on the total catch of salmon by each nation was made. The Soviet catch of salmon in 1962 was 60,560 metric tons (quota 70,000 tons) and the 1961 catch was 79,738 metric tons. The Japanese catch of salmon was about 114,000 metric tons in 1962 (quota 115,000 metric tons) and for 1961 the actual catch was 154,000 metric tons. Agreement on the appraisal of pink salmon resources was finally reached on March 11 with the conclusion that the resources of this species have generally declined and that the run in 1963 would be lower than an average cycle-year level. Evaluation of chum salmon resources was then handled on March 11 and finished on the next day. On March 13, discussion of the condition of red salmon resources was started. (United States Embassy, Tokyo, March 8, 1963 and Japanese Newspapers, March 14, 1963.)

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETING HELD:

The Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) met in Paris, France, February 25-26, 1963, to consider a study of subsidies and technical operational activities which involve sanitary regulations for canned fish and quality standards for frozen fish. The detailed 1964 operational program was also discussed. The United States representative was A. W. Anderson, Regional Fisheries Attache for Europe.

SCIENTIFIC CONSULTANTS DRAFT PROGRAM FOR STUDIES ON SEA POLLUTION

A small group of scientists in a preparatory meeting called by the Committee for Scientific Research of the Organization for Economic Cooperation and Development (formerly Organization for European Economic Development) met in Paris on March 5-6, 1963, to discuss problems of sea pollution. At the meeting the scientists drafted a program of research for approval when the

Committee meets again on June 12-14, 1963. The United States was represented at the meeting by scientists from the U. S. Bureau of Commercial Fisheries and the University of Washington, Seattle, Wash.

The experts reported to the Committee as follows:

The rapidly increasing discharge of polluting substances into the sea has created economic and health problems of the first magnitude for all advanced nations. Cooperative research in this field can be valuable in two ways: (1) by providing a feasible approach to problems truly international in character, such as oil pollution of the high seas; (2) by facilitating individual action in areas of common interest, such as the standardization of bioassay techniques.

A working group recommended by the scientists, if established by the Committee, should be able to achieve much toward increasing knowledge about vital sea pollution problems. If the recommendations of the scientists are adopted by the Committee for Scientific Research, further developments may require the commitments of funds, facilities, and personnel from the United States scientific effort. Returns in the form of cooperative research should be more than commensurate with such commitment.

The following draft recommendations and program of research were to be presented to the Committee for approval at its meeting on June 12-14.

(1) That the Scientific Research Committee proceed to the creation of a cooperative research group whose terms of reference would be to promote studies and research relating to pollution of the sea.

(2) That the delegates of this group be chosen among specialized marine scientists in the various branches of oceanography.

(3) That the group refrain from:

- (a) making any proposals of texts containing regulations, agreements or conventions concerning problems of pollution of the sea;
- (b) advancing wishes or recommendations to other international bodies on subjects outside scientific research;

International (Contd.):

- (c) advancing wishes, recommendations or criticisms concerning any country, member or non-member of OECD on any act of pollution of the sea.

The draft program of research outlined by the scientists states that the principal objective of the program is to promote international cooperation in research on economically feasible means of reducing the effects of pollution in the sea. This aim could be achieved by the following actions:

(1) Collect documentation on the problems of sea pollution in the fields of study and regions chosen by the group.

(2) Report on research being done on sea water pollution or in any other field which could contribute to the solution of pollution problems.

(3) (a) Evaluate and assess methods of measuring the concentration of polluting substances in the sea;

(b) compare sampling and analysis methods;

(c) attempt to standardize these methods.

(4) Gather information on the origin and amounts of pollutants entering the sea, and their subsequent dispersal:

(a) study pollution of coastal waters;

(b) study of pollution of the high seas, including pollution at great depths.

(5) Promote research on physical and chemical interplay and interaction between sea water and pollutants (self-purifying effect of sea water against microbiological pollution, chemical reaction between industrial (effluents) pollutants and sea water).

6. Promote studies--theoretical and instrumental--concerning the effects of water movements of all types on the distribution and dispersion of pollutants.

7. Promote studies on the pollution of sediments on the bed of the sea along the coast or beneath the high seas.

8. Standardize biological determinations of pollutants at all levels of the food chain

from phytoplankton to marketable sea foods, including but not limited to: (a) uptake of materials, (b) tolerance levels, and (c) transport of deleterious materials within the food chain.

9. Promote and carry out studies on pollution effects on communities of living organisms in the sea. These studies would seek to discover the effects of pollutants on single species, but also possible secondary effects occurring because of the interdependence of populations composing the biological community. They would further encompass investigations of changes in the physical environment as related to their effects on the nature of the biological community. (United States Embassy, Paris, March 12, 1963.)

UNESCO INTERGOVERNMENTAL
OCEANOGRAPHIC COMMISSION

FISHERIES COMMITTEE MEETING HELD:

The Biological Committee of the Intergovernmental Oceanographic Commission (IOC) met in Cochin, India, February 24-26, 1963, and in New Delhi, India, February 28-March 1, 1963, to coordinate plans and programs for technical studies of the biology of the Indian Ocean in connection with the International Indian Ocean Expedition. The United States representative was Irvin E. Wallen, Assistant Director for Oceanography, Museum of Natural History, Smithsonian Institution.

Note: See Commercial Fisheries Review, September 1962 p. 58.



Aden Protectorate

SPINY LOBSTER FISHING AND MARKETING AGREEMENT REACHED:

Six months of negotiations between a New York City firm and various agencies of the Eastern and Western Aden Protectorate's Governments and the Sultan of the Quai'ti State of the Eastern Aden Protectorate seem to have resulted in an agreement for catching and marketing spiny lobster or crayfish. It provides first for the creation of a "Mukalla Crayfish Association." (Mukalla is the largest city and principal fishing port of the Eastern Aden Protectorate, the capital of the Quai'ti State).

The Association will have a monopoly on the catching of spiny lobsters, and will organize, assist, and advise the fishermen. The fishermen, in turn, will sell all their catch to the Association, which will pay a premium

Aden Protectorate (Contd.):

price to be determined by the Association. A price has been agreed upon which is satisfactory to all concerned parties. The Association will deliver the frozen and deveined spiny lobsters to the New York firm who will have the exclusive distribution rights for the entire catch which they will then sell, probably almost entirely in the United States.

The Association is starting out without funds. To overcome this, the New York firm will advance or lend the Association the necessary money to begin operations, this money to be repaid from the final sale of the spiny lobsters, with 6 percent interest. In addition, after the firm will deduct its 10 percent commission from the sale price of the spiny lobsters, before the balance is credited to the Association, practically all the expenses of the operation will be deducted, including ocean freight from Aden to the port of destination, and the salary and expenses of the New York firm's advisor now in Mukalla. The New York firm has exclusive distribution rights for a term of five years. Initial shipments of about 10 tons were due to begin in April this year. (United States Consul, Aden, March 16, 1963.)

Note: See Commercial Fisheries Review, September 1962 p. 62.

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AVAILABILITY OF YELLOWFIN TUNA DEMONSTRATED BY EXPLORATORY FISHING:

The Aden Government, the Federation of South Arabia, the administration (British) of the Eastern and Western Aden Protectorates, and the various rulers of the Sheikdoms bordering on the Gulf of Aden and the Indian Ocean, are very interested in developing the tuna fishing potentialities of the Gulf of Aden. At the present time the real potentialities of the area are not known, but surveys and tests are continuing. The Fisheries Department is utilizing all its resources in this direction. At least two United States companies have sent representatives to Aden to survey the feasibility of taking tuna in commercial quantities from the area; and it is hoped that the Indian Ocean surveys now in progress will shed more light on the potentialities of this area. An account of the exploratory fishing operations by the British Fisheries officer in Aden follows:

In July 1962, at about the midpoint of the Southwest Monsoon, the Federation of South

Arabia Fisheries vessel, the 65-foot trawler, Gulf Explorer, under the direction of the Fisheries Officer, began trial operations with Japanese tuna long lines in an area within 26 miles of Aden, to determine the abundance of yellowfin tuna in the Gulf of Aden area. At first, long lines of 150 hooks each were used, and catches were fairly low or about 9-15 fish per set. In the fall, a Japanese tuna long-line expert was assigned by the Food and Agriculture Organization (FAO) to Aden and he began operating from the Federal Star, a slightly smaller Federal Fisheries vessel. The Japanese expert made his first trial runs off the small fishing port of Shuqra, about 75 miles east of Aden, using long lines of 150 hooks each. Over a six-week period catches averaged about 13.6 percent or about 20 fish per set. In December, well into the season of the Northeast Monsoon, the Gulf Explorer, still using long lines of 150 hooks, began averaging a 40 to 50 percent catch rate. In January 1963, a 6-mile experimental long line of 250 hooks averaged a catch rate of 54 percent. At about this time, the Federal vessels were joined by the Genepesca VII of Livorno, Italy,



Fig. 1 - Genepesca VII, Italian fishing boat from Livorno.

Aden Protectorate (Contd.):

which had come out for survey purposes. Assisted by the FAO expert, the Genepesca VII made several trial sets using two-mile long lines of 220 hooks each. On the first three days of fishing the vessel caught fish at rates of 60, 63, and 73 percent.

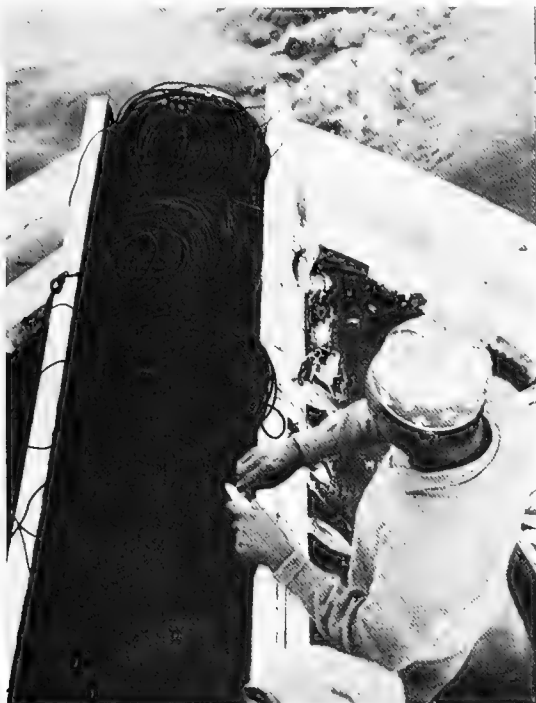


Fig. 2 - Lines prepared by crew are baited prior to "shooting," and are then placed on the "shooting table."

All three of the vessels fished between the depths of 50 and 65 fathoms. The depth of the thermocline was determined by a thermistor thermometer, developed by the Fisheries

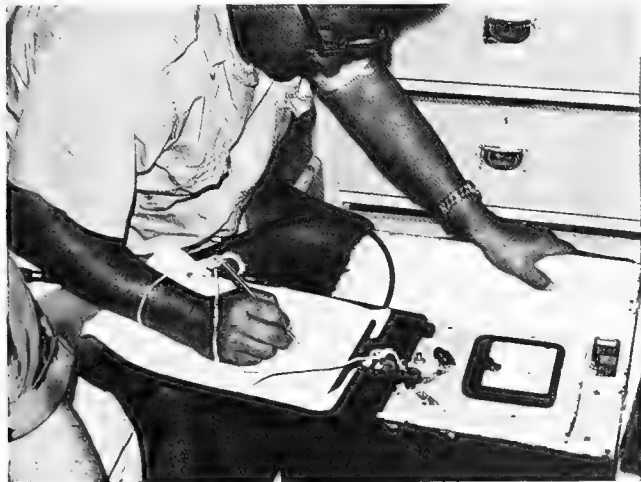


Fig. 3 - FAO Japanese tuna fishing expert taking readings from thermistor thermometer to establish thermocline.

Laboratories, Lowestoft, England, a comparatively simple and inexpensive instrument. The area of greatest success was within a 25-mile radius of Aden itself. The yellowfin taken averaged from 22 to 37 pounds each, although there were exceptional catches of 60 and 157 pounds each. The most successful baits used in the order of their efficiency were: Indian mackerel, scad mackerel, and large sardines. Analysis of the yellowfin stomach contents showed mostly mantis shrimp and later on, during the Northeast Monsoon, swimming crabs. Shark, marlin, swordfish, and sailfish were taken on the same lines.



Fig. 4 - Portion of a morning's catch of yellowfin tuna.

The Federal Fisheries Department in Aden, with the able assistance of the FAO's expert, has designed for the use of local fishing vessels a tuna long line carrying a large number of hooks on short branch lines to be used on one-day trips. The Fisheries Department is attempting by every means possible to assist local fishermen and perhaps develop eventually an indigenous fishing industry.

Aden Protectorate (Contd.):

From the data available, it appears that the prospects seem good for the taking of commercial quantities of yellowfin tuna from the Gulf of Aden. However, the data collected thus far is an inadequate basis for final conclusions. For the future, the Fisheries officer is putting into motion a long-term exploratory and survey program utilizing equipment and techniques developed during the initial trial period. (United States Consulate, Aden, March 23, 1963.)



Australia

IMPORTS AND EXPORTS OF MARINE PRODUCTS, FISCAL YEAR 1961/1962:

Imports: Australian imports of edible fishery products in fiscal year 1961/1962 (July 1961-June 1962) were down 12 percent in value from the previous year. From a

Table 1 - Australian Imports of Edible Fishery Products
Fiscal Year, 1961/1962

Commodity and Country of Origin	Quantity	Value	
		1,000 Lbs.	AL 1,000 US\$ 1,000
Fresh and Frozen Products:			
Finfish Products:			
South Africa	10,538.7	753.7	1,681.5
United Kingdom	6,623.3	900.0	2,007.9
New Zealand	4,330.4	470.6	1,049.9
Denmark	4,303.9	577.9	1,289.3
West Germany	2,179.3	194.8	434.6
Other countries	3,389.1	415.0	925.9
Total finfish products	31,364.7	3,312.0	7,389.1
Shrimp:			
India	457.8	114.5	255.4
China	211.0	65.2	145.5
Hong Kong	190.2	54.1	120.7
Other countries	53.5	15.6	34.8
Total shrimp	912.5	249.4	556.4
Total fresh and frozen fishery products	32,277.2	3,561.4	7,945.5
Canned Products:			
Salmon:			
Japan	8,652.6	2,013.1	4,491.2
Canada	526.3	141.1	314.8
Other countries	191.4	57.1	127.4
Total salmon	9,370.3	2,211.3	4,933.4
Sardines:			
Norway	1,735.4	334.8	746.9
Canada	1,403.9	179.3	400.0
United Kingdom	1,329.1	222.8	497.1
Other countries	991.0	147.4	328.8
Total sardines	5,459.4	884.3	1,972.8
Herring:			
United Kingdom	3,497.1	355.5	793.1
Other countries	998.0	116.7	260.4
Total herring	4,495.1	472.2	1,053.5
Tuna	708.8	95.6	213.3
Other canned fishery products	1,987.4	422.4	942.4
Total canned fishery products	22,021.0	4,085.8	9,115.4

(Table continued on next column.)

Commodity and Country of Origin	Quantity	Value	
		1,000 Lbs.	AL 1,000 US\$ 1,000
Smoked or Dried Products:			
South Africa	6,389.2	486.3	1,084.9
United Kingdom	1,677.0	172.0	383.8
Other countries	293.1	59.4	132.5
Total smoked or dried fishery products	8,359.3	717.7	1,601.2
Other fishery products	2,546.4	170.9	381.3
Total imports of edible fishery products	65,203.9	8,535.8	19,043.4

Table 2 - Australian Imports of Inedible Fishery Products,
Fiscal Year 1961/1962

Commodity and Country of Origin	Quantity	Value	
		AL 1,000	US\$ 1,000
		(1,000 Pounds)	
Fish Meal:			
South Africa	4,466.6	99.2	221.3
Other countries	939.6	21.8	48.6
Total fish meal	5,406.2	121.0	269.9
Cultured Pearls:			
Japan	1/	179.4	400.2
Other countries	1/	9.1	20.3
Total cultured pearls		188.5	420.5
		(1,000 Gallons)	
Marine animal oils	727.0	333.0	742.9
Total value of inedible fishery imports		642.5	1,433.3

1/Not available.

volume standpoint, imports of canned fishery products showed a 20 percent decline, while imports of fresh and frozen fishery products dropped 7 percent.

Exports: The value of exports of edible fishery product in fiscal year 1961/1962 amounted to almost A£6.5 million as compared with A£4.4 million in the previous year, an increase of about 47 percent. Shipments of frozen spiny lobster tails accounted for almost 92 percent of the total value of

Table 3 - Australian Exports of Edible Fishery Products,
Fiscal Year 1961/1962

Commodity and Country of Destination	Quantity	Value	
		1,000 Lbs.	AL 1,000 US\$ 1,000
Fresh and Frozen Products:			
Spiny Lobsters, whole:			
France	341.6	117.6	262.4
United States	89.0	30.7	68.5
Other countries	79.7	25.5	56.9
Total spiny lobsters, whole	510.3	173.8	387.8
Spiny Lobster Tails:			
United States	9,736.4	5,955.6	13,287.0
Other countries	111.4	66.0	147.2
Total spiny lobster tails	9,847.8	6,021.6	13,434.2
Shrimp	120.8	39.9	89.0
Other fresh and frozen fishery products	1,444.9	197.4	440.4
Total fresh and frozen fishery products	11,923.8	6,432.7	14,351.4
Canned fishery products	321.1	57.4	128.0
Other fishery products	201.3	3.8	8.5
Total exports of edible fishery products	12,446.2	6,493.9	14,487.9

Australia (Contd.):

Table 4 - Australian Exports of Inedible Fishery Products, Fiscal Year 1961/1962			
Commodity and Country of Destination	Quantity	Value	
		A\$1,000	US\$1,000
	..... (1,000 Gallons)		
Whale Oil:			
West Germany	922.2	295.0	658.1
United Kingdom	700.3	284.3	634.3
Other countries	277.6	91.7	204.6
Total whale oil	1,900.1	671.0	1,497.0
Other marine animal oils ..	9.8	48.7	108.6
	..... (1,000 Pounds)		
Whale meat, meal, and solubles	1,693.0	62.5	139.4
Fish meal	3.1	1/	1/
Mother of Pearl Shells:			
West Germany	716.7	192.5	429.5
United States	628.1	105.4	235.1
Other countries	665.9	87.0	194.1
Total mother of pearl shells	2,010.7	384.9	858.7
Other shells	649.5	57.0	127.2
Cultured pearls	2/	52.9	118.0
Natural pearls	2/	27.4	61.1
Total value of inedible fishery exports		1,304.4	2,910.0
1/Less than A\$500.			
2/Not available.			

edible exports in 1961/1962. (Fisheries Newsletter, December 1962; Fish Trades Review, December 1962.)

Note: US\$2.231 equals Australian £1.00.

* * * * *

LANDINGS OF FISH AND SHELLFISH, 1960/61 AND 1961/62:

Landings of finfish in Australia during the fiscal year ending June 30, 1962, amounted to

Table 1 - Australian Landings of Principal Species, 1960/61 and 1961/62			
Item	1961/62	1960/61	Percent Increase in 1961/62
	..... (1,000 Lbs.) ..		
Mullet	13,241	11,357	16.6
Australian salmon	11,534	6,630	73.9
Tuna	10,614	9,764	8.7
Shark	8,691	7,635	13.8
Barracouta	6,810	5,982	13.8
Flathead	6,458	5,141	25.6

78.7 million pounds, an increase of about 11 percent over the preceding fiscal year and close to the record landings of 79.5 million pounds landed in the fiscal year 1947/48. Six varieties (may include more than one species) made up close to 66 percent of Australia's total finfish landings in 1961/62.

Landings of spiny lobsters in 1961/62 were about unchanged from the preceding year, but shrimp landings rose 43.0 percent to a record total of 9.4 million pounds.

In 1961/62 Western Australia was the leading producer of spiny lobster with 19.2 million pounds (whole weight). New South Wales received the most variety of fish and shellfish including about all the oyster catch. (Fisheries Newsletter, March 1963.)

* * * * *

TUNA FISHERY TRENDS, JANUARY 1963:

The New South Wales 1962/63 tuna fishery season, beset with severe weather, ended on January 7, 1963, with landings of about 1,491 short tons. This amount was 246 tons below the 1,737 tons landed in the 1961/62 season, and 759 tons below the record of 2,250 tons landed in the 1960/61 season.

The tuna fishery in South Australia was off to a good start this season with about 300 tons landed between January 11-22. As of January 22, there were 18 vessels fishing for tuna. (Australian Fisheries Newsletter, February 1963.)



Table 2 - Australian Landings of Principal Species by State, 1961/62						
Item	Queensland	New South Wales	Victoria	South Australia	Western Australia	Tasmania
	..... (1,000 Lbs.)					
Australian salmon	-	1,384	-	1,050	5,543	2,921
Barracouta	-	-	4,725	-	-	2,061
Flathead	-	3,940	2,318	-	-	-
Morwong	-	2,368	-	-	-	-
Mullet	4,471	5,880	-	-	1,244	-
Shark	-	1,667	3,917	1,581	-	-
Snapper	-	1,803	-	-	1,072	-
Tailor	1,287	-	-	-	-	-
Tuna	-	3,131	-	7,420	-	-
Whiting	-	-	-	1,675	-	-
Crab	625	190	-	-	-	-
Shrimp	1/4,400	1/4,678	-	-	1/239	-
Spiny lobsters	-	1/384	1/1,676	1/4,025	1/19,238	1/3,426
Oysters	-	12,204	-	-	-	-

1/Landed weight.

Canada

BRITISH COLUMBIA COMMITTEE REPORTS ON FISHING LIMITS AND JAPANESE PARTICIPATION IN HALIBUT FISHERY:

According to a Vancouver, B.C., newspaper, the Special Fisheries Committee of the Provincial Legislature has filed a report in the House (Victoria) suggesting that the Federal Parliament in Ottawa not consider ratifying the amendment to the North Pacific Treaty that permits Japanese fishing for halibut in the Eastern Bering Sea, until all British Columbia fishing and conservation groups have been heard. The Committee also urges that the British Columbia fishing boundary be extended to 12 miles from headland to headland baseline excepting areas where the United States has "historical reciprocal fishing rights."

The Committee says it found basic agreement by all segments of industry on the "pressing need to amend the now obsolete 3-mile limit," and recommends Canada to take unilateral action in the matter. The newspaper also reported that the External Affairs Minister was scheduled to meet with Fisherman's Union delegates in Vancouver on March 28 to hear the Union's objections to Japanese halibut and herring fishing in nearby waters. (United States Consul, Vancouver, March 28, 1963.)

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FISHERY PRODUCTS EXPORTS LOWER IN 1961:

In 1961, Canada's fisheries export earnings were the third highest among the fish-exporting nations. Canadian international trade in fish and fish products, however, declined steadily from 1958 to 1961. The exports of fishery products in 1961 amounted to 264,800 tons valued at US\$137.4 million, the lowest in four years.

According to figures gathered by the Food and Agriculture Organization (FAO), in 1958 Canada exported 282,800 tons of fishery products valued at \$156.7. In 1959, exports amounted to 287,800 tons valued at \$151.2 million, and in 1960 exports were down to 275,100 tons valued at \$141.1 million.

Only Japan (who also led the world in total landings with a record 6.7 million tons) and Norway earned more in 1961. The Japanese

exports in 1961 totaled 415,700 tons valued at \$188.2 million and the Norwegians exported 455,900 tons valued at \$139.0 million. (Food and Agriculture Organization, Rome, April 14, 1963.)

* * * * *

FISHING VESSEL CONSTRUCTION AIDED BY SUBSIDY PROGRAM:

According to a statement by the Canadian Minister of Transport shipbuilding under the Government's construction subsidy policy, a total of 268 vessels (valued at about C\$200 million), have qualified for the subsidies. These include only three deep sea ships; all the other being lakers, coastal vessels, fishing vessels, and miscellaneous craft. The actual commitment of funds as of February 25, 1963, under the ship construction assistance regulations is understood to be about \$22 million. Vessels of all types constructed under the Government subsidy program as of late February this year were valued at about \$80 million.

The ship construction assistance program which was announced in May 1961 by the Government and actually did not begin to operate until about six months later together with the older Canadian Vessel Construction Assistance Act, which since the mid-fifties has provided special depreciation and tax exemptions, have been credited with an expansion in 1962 of shipbuilding in Canada which temporarily at least has reversed the sharp decline which had characterized the industry over the previous decade. The cutback from 40 to 35 percent in the subsidy rate effective on March 31 under the regulations hastened the flow of last minute subsidy applications.

The Minister of Transport stated that a large number of vessels which have been built or are building, are for use by fishermen. Although Canada is close to fishing grounds and trawlers are used extensively by Canadians, the first trawler built in Canada was in 1962. A large number of wooden fishing vessels are now being constructed. At the present time, one yard has 16 fishing vessels under construction--enough work to keep that yard busy for two years.

Special vessels are planned for participating in tuna fishing, which has proven of immense economic benefit to the United States and Japan. Good tuna fishing grounds are actually nearer Halifax than California.

Canada (Contd.):

Subsidy applications for which agreements have been fully executed since October 5, 1962, included 23 fishing vessels (mostly trawlers) and 3 accessory type vessels (2 barges and one fish camp). Subsidies granted for the fishing vessels amounted to C\$3,575,000 and for the accessory vessels, \$37,000. These subsidies for fishing vessels and related vessels amounted to about 26 percent of the \$14,147,000 granted for all types of craft since October 5, 1962. (United States Embassy, Ottawa, March 19, 1963.)

* * * * *

LONG-RANGE PROSPECTS FOR EXPORTS OF FROZEN FISH TO EUROPE PROMISING:

A Canadian Frozen Fish Trade Mission to Europe in October 1962 explored the current and long-range market possibilities for Canadian frozen fisheries products in Great Britain, France, Italy, and West Germany. The Mission was sponsored by the Canadian Department of Trade and Commerce. The following summary of the Mission's views and conclusions was prepared by the Department's Fisheries Division Chief.

The objectives of the Mission were: (1) to explore current and long-term market possibilities for Canadian frozen fisheries products in Britain and other outlets in Europe; (2) to become acquainted with the market preferences, and the measure of competition from other exporting countries; and (3) to visit the fish markets, wholesale and retail outlets, and processing plants of frozen fish in Britain, France, West Germany, and Italy, as well as the salt fish trade in both France and Italy.

The Mission members were able to visit fish processing facilities and plants; fresh and frozen fish, wholesale and retail markets; and discuss problems of mutual interest with the leading producers and importers of fish in these major European fish producing and consuming countries. They also had the opportunity of seeing and examining frozen fish products of competitor countries on sale in supermarkets and other retail outlets in Britain, France, West Germany, and Italy--and to gain firsthand knowledge respecting consumer acceptance of Canadian frozen fisheries products vis-a-vis those put up by other fish supplying nations.

Restrictions on the import of frozen fish into Britain were removed in 1959, and it appeared that a new and promising outlet for exports of frozen fisheries products had developed. During the war and pre-war periods, Britain purchased substantial quantities of frozen fish from Canada including salmon and halibut. In 1960, important sales of frozen cod fillets and blocks were also made there, and these exports increased from 1.1 million pounds to over 6 million pounds in 1961. Consequently, the principal port of call was in Britain. However, in view of the recent advances being made in the "cold chain" (refrigerated storage and transportation from the time the fish is frozen until it is sold at retail) in France, West Germany, and Italy, an on-the-spot appraisal of the position was warranted there as well.

All of the countries visited are major fish producing nations, and primarily fresh fish consumers. Over 80 percent of the total landings of demersal fish in Britain (including both domestic and foreign) is used in the fresh form. The bulk of the landings of fish in France, West Germany, and Italy is also consumed in the fresh state.

However, rapid strides are being made in the expansion of available refrigeration facilities. In Britain, for example, the production of quick frozen fish increased from 37,000 tons in 1957 to 56,000 tons in 1961, and imports of frozen fish advanced from 3,685 tons to 20,445 tons. About 44 million pounds of frozen fish fingers (sticks) were put up in Britain last year. The producers indicated that this was merely a start.

The French Government is placing emphasis on increasing the consumption of frozen fillets which, it is estimated, will increase by 5,000 to 10,000 tons per year. This will entail the installation of some 2,500 to 5,000 refrigerated cabinets for the sale of frozen fish at the retail level during the next four years, as well as a corresponding growth in all "cold chain" equipment.

A similar trend is developing in West Germany where there were only 3,000 deep freezing chests available in 1955. These facilities for frozen fish rose to 40,000 in 1960 and to 50,000 in 1961. Indications are that there are presently some 175,000 retail stores in West Germany with only 70,000 deep freezer chests, but it is estimated that by 1963 over 100,000 units will be in operation there.

Italy, too, is conscious of the growing demand for frozen fish or convenience packaged products. One leading Italian producer hopes to increase production from 2,000 tons of frozen fish currently being put up to 10,000 tons by 1970. At present, this individual firm imports 5,000 tons of frozen fish annually.

The Mission found that there is an exceptionally strong demand for Canadian frozen salmon in Britain and France, and considerable interest in West Germany and Italy as well. Frozen halibut is a popular item in Britain and some progress may be made in selling this product in France. The consumption of frozen eels in Europe is increasing, and Canadian producers should have little trouble in marketing good quality eels in any of the markets visited. West German importers, in particular, are anxious to obtain additional supplies. Inquiries were also received for frozen monkfish (angler or allmouth) and porbeagle (mackerel shark) in France and Italy where those species of fish are gourmets' delights; monkfish and porbeagle are available in our Atlantic Coast waters. Heretofore, they have not been taken by Canadian fishermen because of the lack of demand for such fish in North American markets.

While Canadian exporters were able to sell important quantities of frozen cod fillets and blocks in Britain in 1961, current returns, it appears, are below those received from importers in the United States. There was keen interest in obtaining quotations on supplies of Canadian frozen fillets in each of the various markets. Our frozen fillets are recognized as quality products because of the rigid inspection procedures and the proximity of our fish plants to the major fishing banks or grounds.

Retail prices in Britain, France, West Germany, and Italy are considerably higher than those in the United States market, despite the relatively lower prices being paid for frozen fillets at the import level. The long-term prospects for exports of important quantities of frozen fillets to the countries visited are encouraging, particularly in the light of prices the consumers are prepared to pay, and the rising costs of production in most European fish producing countries.

At the present time, the quality of frozen fisheries products originating in Iceland, Norway, and Denmark is comparable with that of similar Canadian products. However, on the assumption that the trend towards freezing at sea continues in European countries, the quality of the frozen fisheries products available to consumers there can be expected to improve.

In view of the uncertainty of the prospects for Britain's entry into the European Common Market and the effects such entry might have on the Common External Tariff, the

Canada (Contd.):

Mission did not devote much discussion to this particular question. While importers in France, West Germany, and Italy did not seem unduly disturbed about the implication of the Common External Tariff as it now exists, should Britain enter the European Common Market the duty on imports of frozen fillets and blocks into Britain from Commonwealth countries would gradually rise from zero to a proposed rate of 18 percent. In the immediate short term, the rate of duty imposed may not be too serious. However, in order to insure that the potential trading opportunities are fully realized, it would be important to have a minimum tariff barrier on access of frozen fish to Europe.

The industry members of the Mission will report their findings to exporters of frozen fish in their individual provinces. (Canadian Fisherman, March 1963.)

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HORMONE TREATMENT MAY HASTEN ATLANTIC SALMON'S SEXUAL MATURITY:

An exploratory investigation into the physiology of the Atlantic salmon was undertaken in 1962 by the Halifax Technological Station of the Fisheries Research Board of Canada. The purpose of the study was to determine whether the sexual maturity of the female salmon can be artificially induced. Scientists hope to increase the spawning incidence of both male and female salmon.

The investigation of Atlantic salmon is related to studies made of the Pacific salmon during the past few years. After spawning, the five species of Pacific salmon die. On the other hand, the Atlantic salmon frequently survives spawning.

Studies of the Pacific salmon disclosed a metabolic impairment of hormones after spawning. It has now been shown that there is no such impairment in Atlantic salmon. It is believed that the metabolic change in Pacific salmon is an indicator of approaching death and is not connected with the act of spawning.

As a result of the hormone studies on the Pacific species, scientists have found it is possible to hasten the development of eggs in the female, and secondary sex characteristics in the male. This is done by artificially inducing a high level of certain hormones normally present at spawning.

A number of female salmon which spawned early last fall were held in salt water by the Halifax station. Under natural conditions, a spawned salmon remains in fresh water throughout the winter and returns to salt water in the spring. During the interval in fresh water, when it normally doesn't eat, it loses its bright colors and returns to the sea in an emaciated condition.

The salmon held in salt water at the Halifax station showed a marked contrast to stocks wintering in fresh water. The captive salmon were rapidly regaining their sleek, silvery appearance. Scientists planned to introduce synthetic hormones into their bodies once they had started to eat and their physical condition had reached a satisfactory level. The hormones are placed in tiny pellets which can be inserted beneath the skin and gradually absorbed by the salmon.

The scientists plan to perform the same experiment with male salmon. They will be held in captivity after spawning and the same process will be used to hasten their sexual maturity.

Once the captive salmon have entered into the reproductive stage, they will be stripped of their eggs and milt. An attempt will be made to keep the sperm in a frozen state until it can be used to fertilize the eggs. From



Stacks of trays containing salmon eggs being lowered into a deep-type trough for the period of incubation.

then on, the operation would become one for the hatcheries. Eggs would be raised in the hatcheries to the parr or smolt stage and then transplanted into fresh water streams to follow their destiny, which takes them to unknown reaches in the oceans and back again to fresh water to spawn.

Scientists feel the experiment has possibilities. If sexual maturity can be hurried, then spawning can be increased and egg production multiplied. (Canadian Fisheries News.)



Chile

FISH CONSUMPTION INCREASES IN SANTIAGO:

Fish consumption of over 18,000 metric tons in Santiago, Chile, in 1962, was 41 percent above the 12,800 tons consumed in 1960, according to the Commission for the Development of Fisheries. A still greater increase is anticipated in 1963 when a fish terminal with wholesale marketing facilities is expected to open in Santiago.

The growth in fish consumption in Santiago is due mainly to the improved quality of fish reaching retail outlets. Shippers have been using ice on fresh fish trucked into Santiago from the coast. In addition, frozen fillets of select fish have moved into the market. The law, effective in mid-1962, which prohibited the sale of beef in public eating places each Wednesday also influenced fish consumption. (United States Embassy, Santiago, March 9, 1963.)



Cuba

PLANS FOR NEW FISHING PORT:

Work on the fishing port planned for Havana, Cuba, was due to begin early in 1963 and be completed within a year, according to the Cuban Government. A refrigeration expert from Edinburgh, Scotland, has signed a five-year agreement with Cuba to supervise construction of the new port for Cuban and Russian fishing vessels. He said the first building materials would be delivered from Russia and Bulgaria.

A statement issued by the Cuban Government when the contract with the Scottish expert was signed, declared that the new port would be able to handle 180 vessels, including 130 Russian fishing vessels. It will have repair facilities for vessels of up to 2,500 tons. A factory at the base will be able to process 180,000 tons of fish a year. (Fish Trades Gazette, January 26, 1963.)

Note: See Commercial Fisheries Review, November 1962 p. 62.



Denmark

FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JANUARY 1963:

Denmark's total exports of fresh and frozen fish fillets and blocks during January 1963 were 83.3 percent above exports in the same month in 1962--herring fillets up 251.7 percent; flounder and sole fillets up 32.7 percent; and cod and related species up 18.1 percent. Of the total exports, about 445,000 pounds (mostly cod and related species) were shipped to the United States in January 1963 as against 210,000 pounds in the same month in 1962. The leading buyer of frozen fillets in January 1963 was West Germany with 45.4 percent of the total, followed by the United Kingdom with 14.7 percent.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, January 1963 ^{1/}			
Product	January		Jan.-Dec.
	1963	1962	1962
	... (1,000 Lbs.) ...		
Fillets and Blocks:			
Cod and related species	2,181	1,847	28,658
Flounder and sole	2,503	1,886	28,255
Herring	4,516	1,285	27,511
Other	67	36	678
Total	9,267	5,054	85,102
	... (Short Tons) ...		
Industrial Products:			
Fish meal, fish solubles, and similar products	4,259	3,362	69,623
^{1/} Shipments from the Faroe Islands and Greenland direct to foreign countries not included.			

During January 1963, Denmark's exports of fish meal, fish solubles, and similar products were 26.7 percent above the amount shipped out in the same month of 1962. The principal buyers were the United Kingdom and West Germany.

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SOVIET FLEET FISHING OFF NORTH SEA COAST:

Near the end of February 1963, a large Soviet fishing fleet had anchored off the small Danish fishing port of Lønstrup on the North Sea coast of Jutland, and was conducting a comprehensive fishery, according to newspaper reports. The fleet consisted of 2 cannery factoryships and 10 fishing vessels. The latter were supplied fuel by a tanker. (Regional Fisheries Attache for Europe, U. S. Embassy, Copenhagen, March 13, 1963.)



France

ARBITRATION PROPOSED FOR SPINY LOBSTER FISHING DISPUTE WITH BRAZIL:

The International Court of Justice has confirmed the willingness of the French Government to submit their dispute with Brazil over spiny lobster fishing rights to arbitration, according to newspaper reports in The Hague on April 2, 1963. The press announced that the Court had forwarded the French statement to Brazil and had promised full cooperation should the parties wish to make use of the International Court of Justice to settle the dispute. (United States Embassy, The Hague, April 6, 1963.)

The dispute involves the rights of French fishing vessels to take spiny lobsters from international waters over the continental shelf adjacent to Brazil. The Brazilians say that the spiny lobsters live on the ocean bottom and are thus part of their country's resources on, or in the continental shelf. The French contend that the spiny lobsters are sometimes water borne and that as such, can be fished by anyone in international waters.

The dispute was sharpened in late February 1963 when six French fishing vessels off Brazil were ordered to leave the area by Brazilian authorities. They refused and the French Government sent a destroyer escort to the scene. Later, on March 9, 1963, France ordered the six French vessels and their naval escort to leave the area.



Ghana

SOVIET-BUILT FISHING VESSEL DELIVERED:

A Ghanaian fishing firm with headquarters at Tema took delivery on March 2, 1963, of a £G193,500 (US\$541,800) freezer-trawler built at Kiev in the Soviet Union. Named The Pioneer, the 927-ton vessel (176 feet) was reported to have storage space for 150 to 160 metric tons of fish and a daily freezing capacity of 6 tons. It was said to have accommodations for a crew of 32, and a maximum speed of 11½ knots per hour. The Ghanaian press reported that 4 technicians and 3 fishermen from Ghana were included in the crew which brought the ship to Tema. Apparently Soviet personnel will be largely responsible for the vessel's operation.

The Pioneer is the second Soviet ship delivered to the Tema firm. The first, a smaller fishing vessel which cost £G30,000 (\$84,000), was delivered in August 1962. Another private fishery firm in Ghana placed an order recently with Sudoimport, a Soviet organization, for delivery of a £G170,000 (\$476,000) trawler in 1964.

The Ghanaian Ministry of Agriculture placed a £G1,670,000 (\$4,676,000) order with Sudoimport in August 1961 for ten fishing trawlers, the first of which was expected to be delivered in June 1963. Those ten vessels will be operated by the Ghana Fishing Corporation. (United States Embassy, Accra, March 5, 1963.)



Guatemala

JOINT JAPANESE-GUATEMALA SHRIMP FISHING VENTURE:

The joint Japanese-Guatemalan shrimp fishing company established at Champerico, Guatemala, in 1961 is now reported to be in full operation. The joint company's shrimp fleet consists of 32 vessels, 20 of which the company owns. March 1963 reports indicate that fishing was good and annual shrimp production is expected to total about 2 million pounds heads-off.

The joint company began operations in November 1961 and started with a fleet of eight vessels. For the period November 1961 through December 1962, the company produced about 1.3 million pounds of shrimp (heads-off), which were shipped mostly to Los Angeles and New York at prices averaging 95 U. S. cents a pound f.o.b. Champerico.

Base facilities at Champerico include a 100-ton capacity refrigerated plant and a quick-freeze unit of 12.5-ton capacity. (Suisan Tsushin, March 11, 1963.)



Iceland

FISHERIES LANDINGS, 1962:

Landings of fish and shellfish for 1962 in Iceland were about 820,000 metric tons as compared to 710,000 tons for 1961, an increase of 17 percent. The excellent 1962

Iceland (Contd.):

herring landings of 473,000 tons (329,000 tons in 1961) were chiefly responsible for the increase in 1962. The extended season (almost year round now), locating new fishing grounds, use of electronic detection equipment, and possibly a peak in herring abundance all contributed to the increased herring landings. Groundfish landings, however, were only 346,000 tons as compared to 381,000 tons in 1961. Bad weather last spring, the long trawler tie-up, and a drop in landings of ocean perch all contributed to the decrease.



Fig. 1 - Fresh cod being unloaded in net from fishing boat into truck at main fishing pier.

The trawlers' share of the 1962 landings dropped to 5 percent, whereas previously they landed as high as 40 percent of the catch. While part of this decline resulted from the vessel tie-up, which lasted from March 10 to July 5, 1962, the Minister for Fisheries claims that the primary reason is the exclusion of trawlers from the fisheries limits. Although exclusion of trawlers from waters within the 12-mile limit has resulted in financial problems for trawler owners, it has also resulted in a definite improvement of fish stocks around Iceland, according to an Icelandic biologist.

Total production of frozen fish in Iceland's 90 freezing plants during 1962 was 82,000 tons, of which 45,500 tons were frozen fish fillets (excluding herring). A breakdown follows of the different varieties of frozen fish fillets, which account for 25 percent of Iceland's total exports: cod 23,912 tons (25,275 tons in 1961); haddock 10,002 tons (9,598 tons in 1961); wolffish 3,049 tons (2,815 tons in 1961); ocean perch 3,752 tons (6,248 tons in 1961), coalfish

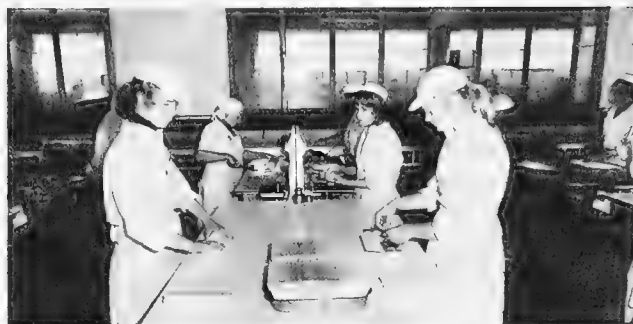


Fig. 2 - Trimming and packing fillets in an Icelandic fish processing plant.

1,431 tons (1,263 tons in 1961; and ling 798 tons (164 tons in 1961).

A great increase in the freezing of herring has occurred in recent years and accounts for the increase in total frozen fish production. In 1962, frozen herring amounted to 25,500 tons as compared to 3,733 tons as recently as 1960.



Fig. 3 - An Icelandic fishing harbor, showing vessels at dock and processing plant.

Statistics on other major types of fish production in 1962 are as follows: herring oil 63,000 tons; herring meal 72,000 tons; shrimp and lobster 2,900 tons. Whale production also increased significantly in 1962--480 whales as compared to 350 in 1961. (United States Embassy, Reykjavik, March 1, 1963.)

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FISH OIL USED IN PAINTS:

During past years the Research Institute of the Fisheries Association of Iceland has experimented with using fish oils from saithe

Iceland (Contd.):

(pollock) and haddock in the manufacture of paints. This research has been successful and considerable quantities of paints have been produced on this basis for experimental purposes. It is anticipated that an Icelandic paint firm will start commercial production of such paints in the near future.

The oil, which replaces linseed oil, will also be used to produce varnish. In 1962, Iceland imported 207.3 metric tons of linseed oil. Most of this oil has been used for paint production. (U. S. Embassy, Reykjavik, February 21, 1963.)

EXPORTS OF FISHERY PRODUCTS, 1962:

During 1962, there was a considerable increase in exports of frozen herring, frozen

fish fillets, salted herring, herring oil, herring meal and frozen whale meat as compared with 1961, according to the Statistical Bureau of Iceland's Statistical Bulletin, February 1963. Exports of fish meal, ocean perch meal, frozen fish waste, lobster and shrimp meal, whale meal, and salted fish showed a considerable decrease in 1962

FIRM GRANTED PERMISSION TO EXPORT SALT FISH:

An independent Icelandic exporter has been granted official permission to export a large quantity of salt fish (excluding herring) to Italy and other countries. The exporter will represent 12 salt-fish producers whose output in 1962 was 1,500 metric tons (about 5 percent of the total salt-fish exports) of which 700 tons were exported at reportedly favorable

Icelandic Fishery Exports, 1962 with Comparisons

Product	1962			1961		
	Qty.	Value f.o.b		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	3,184	64,012	1,485	4,646	88,463	2,176
Salted fish, uncured	26,670	321,297	7,454	29,109	297,328	7,314
Wings, salted	1,045	12,032	279	1,324	12,313	303
Stockfish	10,654	281,274	6,526	10,674	258,751	6,365
Herring on ice	7,022	23,773	552	6,025	17,408	428
Other fish on ice	30,864	167,999	3,898	33,519	176,556	4,343
Herring, frozen	24,126	132,512	3,074	14,456	69,695	1,714
Other frozen fish, whole	2,883	37,201	863	2,819	33,665	828
Frozen fish fillets	50,200	884,272	20,515	41,784	660,379	16,245
Shrimp and lobster, frozen	420	44,508	1,033	507	41,663	1,025
Roes, frozen	720	13,680	317	607	8,472	208
Canned fish	429	23,136	537	373	22,336	549
Cod-liver oil	5,313	40,994	951	5,949	47,278	1,163
Lumpfish roes, salted	449	6,823	158	536	9,039	222
Other roes for food, salted	2,746	37,936	880	2,546	25,800	635
Roes for bait, salted	1,407	8,831	205	1,348	8,131	200
Herring, salted	47,290	469,008	10,881	33,738	329,044	8,094
Herring oil	60,478	241,755	5,609	25,000	132,479	3,259
Ocean perch oil	15	61	1	981	4,919	121
Whale oil	1,687	13,660	317	1,540	11,800	290
Fish meal	20,230	126,736	2,940	28,693	119,105	2,930
Herring meal	48,489	314,420	7,295	37,583	203,581	5,008
Ocean perch meal	437	2,451	57	3,735	17,003	418
Wastes of fish, frozen	7,168	18,853	437	12,283	22,231	547
Liver meal	320	2,129	49	345	2,023	50
Lobster and shrimp meal	212	846	20	395	1,058	26
Whale meal	602	3,286	76	1,493	5,769	142
Whale meat, frozen	2,484	18,689	434	1,620	11,631	286

Note: Values converted at rate of 1 kronur equals 2.32 U. S. cents in 1962 and 2.46 U. S. cents in 1961.

Iceland (Contd.):

prices. (United States Embassy, Reykjavik, February 21, 1963.)

TRADE AGREEMENT WITH HUNGARY INCLUDES FISHERY PRODUCTS:

A protocol for bilateral trade between Iceland and Hungary was signed on February 5, 1963, for a period of about one year ending December 31, 1963. The agreement allows for an exchange of £140,000-150,000 (US\$392,000-420,000) worth of products each way. Iceland will undertake to export up to £30,000 (\$84,000) worth of fish fillets, an undetermined amount of salt and frozen herring, small quantities of wool and sheepskins, canned fish, and fish meal. The products to be imported from Hungary do not include any fishery products. (United States Embassy, Reykjavik, March 15, 1963.)

UTILIZATION OF FISHERY LANDINGS, JANUARY-OCTOBER 1962:

How Utilized	January-October	
	1962	1961
	... (Metric Tons) ...	
<u>Herring</u> ^{1/} for:		
Oil and meal	330,953	184,447
Freezing	18,194	12,198
Salting	55,515	56,164
Canning	336	114
<u>Groundfish</u> ^{2/} for:		
Fresh on ice landed abroad . .	29,379	28,744
Freezing and filleting	125,478	133,359
Salting	68,768	65,701
Stockfish (dried unsalted) . . .	33,767	44,581
Home consumption	11,583	9,560
Oil and meal	2,929	3,414
Total production	676,902	538,282
1/Whole fish.		
2/Drawn fish.		



Iran

UNITED STATES LEADING IMPORTER OF CAVIAR IN 1961/62:

For the first time in the history of Iran's sturgeon fishery, the United States in the "fishing year" that ended April 1962, led all other countries as an importer of sturgeon roe or caviar. Exports to the United States in 1961/62 amounted to 56 metric tons as compared with 46 tons exported to the Soviet Union. The western European countries

collectively, imported 58 tons, and 10 tons were consumed in Iran.

Sales of Iranian caviar to the United States are based on bids resulting in a contract between the National Iranian Fisheries Company and a private United States trading firm. (United States Embassy, Tehran, February 11, 1963.)



Israel

JOINT ISRAELI-NORWEGIAN FISHING COMPANY FORMED:

A joint Israeli-Norwegian deep-sea fishing company has been formed with the establishment of a partnership between a Haifa fishing company and a Norwegian fishing firm. The new company will fish off West Africa and in the North Sea and plans to market its catch in Israel and Mediterranean and African countries.

In 1962, Israeli per capita fish consumption reached 9.7 kilograms (about 21.3 pounds). The Israeli landings in 1962 totaled 16,400 metric tons, an increase of 1,500 tons over 1961. (United States Embassy, Tel Aviv, March 15, 1963.)



Italy

QUOTA INCREASED ON DUTY-FREE IMPORTS OF FROZEN TUNA:

The Italian Government fixed the nontaxable quota of tuna imported from countries other than members of the European Economic Community (EEC) as 25,000 metric tons in 1962. At the request of the tuna canners, it announced an increased quota of 32,000 tons for 1963. Any quantity in excess of that quota is subject to a 7.5 percent duty.

The Italian Canners Association appears satisfied with the decision but is expected to ask EEC headquarters in Brussels, Belgium, for the establishment of an additional quota of 6,400 tons.

In this connection, the canners in Italy asked Japan whether such a large amount could possibly be supplied. At the same time they expressed their dissatisfaction over the

Italy (Contd.):

fact that Japanese products are much higher priced than those of South Africa, Australia, and the former French colonies, and that more big-eyed tuna than other species are found in the Japanese shipments. (Suisan Tsushin, February 27, 1963.)



Ivory Coast

TERRITORIAL WATERS EXTENDED TO 12 MILES:

Meeting in extraordinary session March 20, 1963, the Ivory Coast National Assembly passed unanimously, except for one abstention, a completely revised National Property Code. One of the provisions of the new Code extends territorial waters from 3 to 12 miles. The controversial reforms contained in the law evoked spirited and at times acrimonious debate. However, the article incorporating the change in definition of territorial waters was not even discussed. The Assembly rapporteur stated simply that the extension "takes into account the interests of both trawlers and tuna fishermen." (United States Embassy, Abidjan, March 22, 1963.)



Japan

CANNED TUNA PRODUCTION AND EXPORT REGULATIONS, FY 1963:

The Japan Marine Products Export Promotion Council, a Government agency responsible for the drafting of ordinances to regulate the flow of certain export commodities for the purpose of maintaining orderly marketing abroad, held its 14th meeting on March 14. At the meeting, the Council agreed to add whale oil to the list of fishery products under export control, of which there presently are twelve. They are canned tuna in brine, other canned tuna, frozen tuna, frozen swordfish, canned sardine, canned saury, fish liver oil, agar-agar (natural), agar-agar (industrial), canned crab, canned salmon, and canned jack mackerel.

The Council also deliberated the establishment of an ordinance to regulate sales of canned tuna for export (to the United States) for fiscal year 1963 (April 1963-March 1964). This proposed ordinance, which was expected to go into effect on April 1, is summarized as follows:

Restrictions on Methods of Sales: (1) Packers of canned tuna, in selling their products, must consign their production to the Tokyo Canned Tuna Sales Company. However, this provision does not apply to packers who, with the approval of the Minister of Agriculture and Forestry, are clearly engaged in the production of canned tuna for domestic consumption. (2) Packers applying for approval to pack tuna for domestic consumption in accordance with the provision of Item 1 must submit to the Minister of Agriculture and Forestry an application specifying the destination of

their shipment, the kind and price of pack, and packing date, accompanied by a document certifying that their canned tuna will be sold only for domestic consumption. (3) Packers must first obtain approval of the Minister of Agriculture and Forestry if they wish to cancel their consignments to the Tokyo Canned Tuna Sales Company.

Restrictions on Production of Canned Tuna for Export:

(1) Tuna packers (newly licensed to pack canned tuna for export in FY 1962) with production records of less than 500 cases (for export) during FY 1962 (April 1962-March 1963) shall be permitted to pack a total of 500 cases of canned tuna for export during FY 1963. (2) Established tuna packers (not including those in the preceding category) with production records prior to March 31, 1963, shall be permitted to pack for export a combined total of 340,000 cases during the period April 1-June 30, 1963; 680,000 cases during the period July 1-December 31, 1963; and 850,000 cases during the period January 1-March 31, 1964, provided that the daily production of each packer in this category does not exceed 500 cases. (Note: Production allotment for the three periods totals 1,870,000 cases. As such, they are believed not to include unassigned quota.) (3) Tuna packers without records of having produced canned tuna for export prior to March 31, 1963, shall be licensed to pack a combined total of up to 5,000 cases of canned tuna for export in FY 1963. Applications submitted by packers in this category shall be processed in the order that they are received.

Quantity of canned tuna for export that can be packed by June 30, 1963, by each (qualified) established packer is 4,500 cases and by each newly licensed packer 500 cases.

Quantity of canned tuna for export that each established packer in the following categories can pack (for FY 1963) is as follows: (1) Packers with no production record prior to FY 1955 but with four years of production since FY 1956, 2,000 cases. (2) Packers with no production record prior to FY 1955 but with three years of production since FY 1956, 1,500 cases. (3) Packers with no production record prior to FY 1955 but with two years of production since FY 1956, 1,000 cases. (4) Packers with no production record prior to FY 1955 but with one year of production since FY 1956, 500 cases.) (Suisan Keizai Shimbun, March 15, 1963.)

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EXPORTS OF CANNED TUNA IN OIL AND SPECIALTY PACKS, 1962:

According to the Japan Export Tuna Packers Association, the canned tuna in oil approved for export during April-December 1962 was 1,021,295 actual cases, about 11 percent less than the 1,146,805 cases exported in a similar period of 1961. During 1962, 1,387,885 cases were exported, only 20,000 cases less than the 1,406,527 cases exported in 1961, but an increase of 20 percent over the 1,164,346 cases exported in 1960.

Canned tuna exports other than in oil or brine totaled 337,586 cases (including 69,038 cases of jelly tuna, 257,455 cases of vegetable tuna, 8,075 cases of tuna in tomato sauce, 1,550 cases of tuna in curry sauce, and 1,468 cases of other packs) for the period April-December 1962, almost twice as much as the 168,447 cases exported in the same period

Japan (Contd.):

of 1961. (Suisan Tsushin, February 20, 1963.)

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EXPORT PRICES FOR JAPANESE CANNED TUNA IN BRINE REVISED:

The Tuna Standing Committee of the Japan Canned Foods Exporters Association, at a meeting held on March 28, 1963, is reported to have decided to raise again the export price of canned white meat tuna in brine, this time by 30 cents per case (48 7-oz. cans/case) to \$10.40 per case f.o.b. Japan. It plans to maintain the existing export price (\$7.60 per case) for canned light meat tuna in brine.

The new prices would affect the April sale of canned tuna in brine. For the April sale, the Tuna Standing Committee planned to offer 110,000 cases of white meat tuna and 90,000 case of light meat tuna. The 200,000 cases were to be loaded for shipment to the United States in April and May.

For the March sale (90,000 cases of white meat tuna and 60,000 cases of light meat tuna), the Tuna Standing Committee had raised the export price of canned white meat by 20 cents per case. Thus, within a one-month period, the Committee has voted two increases in prices for white meat tuna, totaling 50 cents per case. The Committee for the February sale had lowered the price of canned white meat tuna in brine to \$9.90 a case. (Nihon Suisan Shimbun, April 1, 1963.)

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OPERATIONS OF TUNA CANNERIES IN PUERTO RICO REVIEWED:

Two more United States tuna canneries will be in full operation in Puerto Rico in 1963, in addition to the two United States tuna canneries already established, according to a report by the Japanese Export Trade Promotion Association. The raw tuna required by those four plants will total 445-485 tons per day with storage facilities expected to reach 8,600 tons.

In 1962, the two established plants received tuna amounting to 56,389 tons, of which 18,745 tons (33.2 percent of the total) were imported from Japan, 18,078 tons came from Peru and Ecuador, and landings by United States purse seiners amounted to 13,246 tons.

Large quantities of tuna arrived in Puerto Rico in the summer of 1962. A total of 7,000 tons was received in July, 6,000 tons in August, and 6,300 tons in September which greatly exceeded Puerto Rican production and storage capacities. During that period a sharp drop in export price of frozen tuna to the United States occurred.

Also, in 1963, Peru and Ecuador will be making an effort to build new vessels and increase their tuna fishing fleets. According to the Japanese Association 85 percent of the tuna exports by the two countries are shipped to Puerto Rico (concentrated in June-September). It is generally anticipated that landings of tuna in Puerto Rico for the tuna canneries will surpass those of last year. (Suisan Tsushin, February 23, 1963.)

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EXPORT PRICE FOR FROZEN ALBACORE HIGH IN MARCH 1963:

The export price of frozen albacore tuna in mid-March 1963 was up sharply from the low level of December 1962 and by mid-month was approaching the record high of US\$405 a short ton f.o.b. Japan set in the early postwar days.

A Japanese newspaper commenting on the firm market for frozen albacore states that the sharp price increase indicated a firm market in the United States. The same source also states that the albacore fishing season in both the Atlantic and Indian Oceans was over, and that the poor catches of albacore from the Indian Ocean aggravated the tight supply situation. This source also predicted a poor albacore fishing season in waters near the Japanese coast and that the tuna canners will probably bid up the ex-vessel price. Therefore, the newspaper states, the mid-March albacore price level might persist until August when the United States west coast fishery for albacore gets into high gear.

The mid-March price for frozen yellowfin for export was \$330-335 a short ton with demand only fair. (Suisan Tsushin, March 12, 1963.)

At the end of March 1963, another Japanese periodical (Nihon Suisan Shimbun, March 29, 1963), reported that the prevailing export price for frozen albacore tuna f.o.b. Japan was \$410 a short ton.

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Japan (Contd.):

**PRICES LOWER FOR
ATLANTIC-CAUGHT FROZEN TUNA:**

Japanese press reports indicate that Atlantic Ocean-caught albacore tuna are currently being exported to the United States at a much lower price than albacore exported directly from Japan proper. The late March 1963 export price of Atlantic-caught albacore tuna transshipped to the United States was quoted at \$350 per short ton, and that for Atlantic-caught yellowfin tuna at \$325 per short ton (20-100 pounds, gilled and gutted), f.o.b. Las Palmas, Canary Islands. In comparison, the price of albacore tuna exported directly from Japan to the United States was quoted at \$400-410 per short ton and yellowfin tuna at \$335-340 per short ton. (Suisan Tsushin, March 20, 1963.)

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**FROZEN TUNA EX-VESSEL
PRICES INCREASED:**

The demand for frozen tuna in Japan was very strong as of early March 1963. According to Japanese press reports, the ex-vessel price for frozen albacore was increased to 158-160 yen per kilogram (US\$398-403 per short ton), and for yellowfin to 145-150 yen per kilogram (US\$365-378 per short ton). (Suisan Tsushin, March 12, 1963.)

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**FROZEN TUNA EXPORTS FOR
FISCAL YEAR 1963 ALLOCATED:**

The Japanese Export Frozen Tuna Fisheries Cooperative held its directors' meeting to draft regulations for frozen tuna and swordfish quotas for fiscal year 1963. The following plans were to be presented to an emergency general meeting scheduled for March 8, 1963.

Plans for frozen tuna exports: (1) Direct shipments (including transshipment of mother-ship tuna at Suva): (a) albacore production quota for the United States and Canada--24,000 short tons, of which 21,600 tons is the fixed base quota, 2,250 tons is the free base, and 150 tons is the reservation quota; (b) the yellowfin production quota for the United States and Canada--36,000 tons, of which 32,400 tons is the fixed base quota, 3,450 tons is the free base quota, and 150 tons is the reservation quota; (c) the loin quota for the United States and Canada--6,000 tons, of

which 4,800 tons is the fixed base quota, 1,180 tons is the free base quota, and 20 tons is the reservation quota (when loins are made, 1.5 tons is deducted either from the albacore quota or the yellowfin for every 1 ton of loins); (d) adjustment quota--less than 15,000 tons (when the use of the albacore or yellowfin quota reaches a certain fixed quantity, this quota is made available through a resolution by the board of directors).

(2) Production at sea: (a) the production quota for the transshipment from the Indian Ocean is 4,000 tons with restriction of 150 tons per vessel (in addition, however, transshipment from the Indian Ocean may be made by switching a quantity from the direct shipment quota; (b) production quota for Italy is 14,000 metric tons for the fixed base quota plus the 0.5 voyage quota per vessel; (c) transshipment quota from the Atlantic for the United States and Canada--120 voyages per year (about 35,000 tons); the restriction of the number of voyages per vessel is the same as in the past.

The plan for frozen broadbill swordfish is: production quota--8,500 short tons, of which 5,500 tons is the fixed base quota and 975 tons the free base quota. (Suisan Tsushin, February 25, 1963.)

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**TARGETS FOR TRANSSHIPMENT
OF ATLANTIC-CAUGHT TUNA,
APRIL-JUNE 1963:**

The Atlantic Tuna Committee of the Japan Frozen Foods Exporters Association, at a meeting held in Tokyo, was reported to have established the following frozen tuna trans-

Targets for Transshipment of Frozen Tuna from Atlantic Catch, April-June 1963				
Destination	April	May	June	Total
	(Short Tons)			
United States	6,650	2,830	3,010	12,490
Italy	4,070	7,320	6,070	17,460
Yugoslavia	1,130	700	600	2,430
Las Palmas, Canary Islands	600	250	250	1,100
Other European countries .	340	320	600	1,260
Total	12,790	11,420	10,530	34,740

shipment targets for April, May, and June 1963. (Shin Suisan Shimbun Sokuho, March 30, 1963.)

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**TUNA LANDINGS QUOTA INCREASED
FOR AMERICAN SAMOA:**

On March 15, 1963, the Japanese Fisheries Agency announced that the American Samoa

Japan (Contd.):

tuna landings export quota would be increased from the present 18,000 tons to 27,000 tons. The increased quota of 9,000 tons will be allocated to one of the large Japanese fishing firms and a Japanese fisheries cooperative group. Two Japanese trading firms have negotiated sales contracts with fishing firms. It is believed that all tuna landed under the added quota will be sold to the large United States tuna firm which will build a new cannery in American Samoa. The present tuna landings quota of 18,000 tons is utilized by a cannery owned by another United States firm.

Thirty tuna fishing vessels of the 100-ton class are expected to be diverted from the Japanese coastal tuna fishery to fish for tuna in the American Samoan area. (United States Embassy, Tokyo, March 15, 1963.)

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FISHING BASE IN THE CANARY ISLANDS:

At a press conference held by Japanese representatives who attended the meeting of the International Labor Organization (ILO) Fisheries Committee in Switzerland, conditions at the Las Palmas, Canary Islands, base off the west coast of Africa were explained. It was pointed out that the local industry is showing an unreceptive attitude toward Japan's fishing industry.

Las Palmas is being used as a base for some 40 Japanese pelagic tuna vessels and trawlers. The mild climate and abundant supply of provisions will continue to attract the fishermen as long as catches are good.

Local fishermen are somewhat hostile to Japanese fishing vessels and in many cases there is a difference of opinion on the selling price of fish. But the local government has adopted a friendly attitude toward Japanese fishing vessels because they spend a considerable amount of money in a year's time.

According to vessel operators, tuna and bottomfish catches are declining to about half what they were 4 or 5 years ago. In the case of tuna fishing, one trip is certain in about a 3-month period.

Japan is planning to build recreational and housing facilities in Las Palmas in cooperation with the Spanish Seamen's Society in the near future, and is considering send-

ing a Japanese as supervisor. A study is to be made by the Japan Fisheries Society and Fisheries Agency to reach a conclusion on some type of cooperative setup. (Suisan Tsushin.)

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TUNA LANDINGS QUOTA FOR CANARY ISLANDS CONSIDERED:

The Japanese Fisheries Agency in December 1962 announced a policy permitting the landing of frozen tuna at Las Palmas, Canary Islands, on a base of 2,000 metric tons a year with a partial quota of 700 tons for 4 months applicable to the fiscal year ending March 31, 1963, on condition that the quota would be recognized for local consumption. At the same time a provisional plan of the allocation of the quota for fiscal year 1963 and forward was shown. The plan provided for: (1) landings of 150 tons per vessel a year; (2) monthly landings would be limited to 300 tons; and (3) in case of an application for permission for landing of more than 300 tons in a month, the order of the permission would be determined by lottery. This method would be enforced in coordination with the Export Frozen Tuna Manufacturers Association. The Atlantic Committee of Japan Frozen Food Exporters Association holds that the 2,000 tons a year quota is impracticable. The exporters' association, therefore, in February 1963 filed a representation with the Government requesting a reconsideration. The association wants a temporary export quota of 500 tons for April/May 1963 and the same tonnage for June/July with a provision that in case of excessive applications above the monthly limit, the determination should be made by means of internal negotiation within the membership. This problem is connected with one which has priority, "permission of landing" or "export license" and is watched with interest by the Japanese industry.

The Japanese Export Frozen Tuna Manufacturers Association on March 5 discussed the quantity of Atlantic tuna to be landed at Las Palmas, Canary Islands, and reached an agreement as follows: (1) the landing limit of 2,000 metric tons a year is reacknowledged; (2) the permit should consist of one for both landing by fishing vessels and for export by trading firms; and (3) priority order should be studied every 2 months on the basis of a planning list to be presented from both the fishing vessels and the trading firms, and then determined according to the actual affairs. (Japanese newspapers, February 27 and March 6, 1963.)

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Japan (Contd.):

PLANS FOR TUNA FISHING BASE IN FIJI ISLANDS:

The joint tuna fishery undertaking in the British Fiji Islands is developing steadily. As of mid-February 1963, the jointly owned Pacific Fishing Company was preparing for the establishment of a cold-storage plant and had filed an application for organization of the company. Permission by the Fijian Government was expected by the end of March. If this materialized the Government's Overseas Investment Liaison Committee was to be contacted for its approval, and the construction of the cold-storage plant with a capacity of 3,000 metric tons was expected to begin in May. Japanese officials of the new company were tentatively selected.

Participating fishing vessels will consist of 13 newly authorized vessels, 8 or 9 vessels belonging to the South Pacific Fisheries Cooperative, and 7 or 8 individually owned vessels. Annual landings are estimated at 15,000 tons.

The joint company with permission of the Fijian Government was originally named the Pacific Fishing and Canning Company, but later the Japanese Government was reluctant to include the word "canning." A corrected application omitting the word was filed later. (Suisan Tsushin, February 19, 1963.)

NEW TUNA FISHING BASE AT NEW CALEDONIA:

One of the largest Japanese fishing companies will establish a joint fishing company with local interests at Noumea, New Caledonia, as soon as a license is issued by the French Government. About 5 million New Caledonia francs (about US\$55,556) will be invested in the company--51 percent by the local New Caledonia Development Company, and 49 percent by the Japanese company. Plans call for a cold-storage, freezing, and ice-making plant at Noumea and a start in operations by the end of 1963, as soon as the undertaking is authorized.

The capacity of the plant will be 2,000 tons of frozen products, 70 tons freezing capacity, 70 tons of ice per day, and 200 tons of ice storage. The plant will cost about \$1.2 million. Using about 40 vessels of the 100-ton class, tuna fishing will be carried out from the base, and yearly land-

ings of yellowfin and albacore tuna will be about 15,000 tons, of which some 60 percent will be exported to the United States and France. The remaining 40 percent will be shipped back to Japan. (Japanese newspaper, February 20, 1963.)

VESSELS ENGAGED IN THE SKIPJACK TUNA FISHERY, 1961-62:

As of December 31, 1962, according to the Japanese Fisheries Agency, vessels licensed for skipjack tuna fishing were as follows: 77 vessels, more than 40 tons and less than 70 tons (a decrease of 32 vessels from the previous year); 260 vessels, more than 70 tons and less than 100 tons (a decrease of 40 vessels); and 126 vessels, more than 100 tons and less than 180 tons (a decrease of 53 vessels).

These decreases were the results of supplementing tonnage to enlarge new vessels. The latest number of each tonnage class (1961 is in parentheses) are as follows:

The 40-ton class, 3 (9); 50-ton class, 5 (13); 60-ton class, 69 (87); 70-ton class, 7 (13); 80-ton class, 34 (54); 90-ton class, 219 (233); 100-ton class, 2 (1); 110-ton class, none, (1); 120-ton class, 4 (9); 130-ton class, 9 (25); 140-ton class, 27 (41); 150-ton class, 34 (56); 160-ton class, 12 (17); 170-ton class, 38 (39). (Fisheries Economic News, February 26, 1963.)

EXPORTS OF PRINCIPAL CANNED FISHERY PRODUCTS, 1961-62:

According to figures released by the Japanese Ministry of Finance, canned fishery products exports valued at US\$157 million were cleared (through Customs) in calendar year 1962. This represents an increase in value of

Japanese Exports of Canned Fishery Products, 1961-1962				
Product	Quantity		Value	
	1962	1961	1962	1961
	1,000 Cases		US\$1,000	
Salmon	2,616	1,260	91,231	37,094
Tuna in oil	1,410	1,434	10,725	10,192
Tuna in brine	2,191	2,205	19,646	19,172
Mackerel	1,043	938	3,736	3,501
Saury	938	405	5,628	2,187
Sardine	140	313	1,170	2,451
Jack mackerel	412	628	2,919	4,284
Crab	449	496	10,807	11,856
Shrimp	177	32	2,377	474
Oyster	414	431	3,058	2,928
Others	779	500	5,804	4,887
Total	10,569	8,642	157,101	99,026

Japan (Contd.):

\$58 million or 58.6 percent over the 1961 exports valued at \$99 million. Canned salmon exports in 1962 as compared with 1961 increased by \$54 million or 107.6 percent and canned shrimp exports rose by \$1.9 million or 401.5 percent. (Suisan Tsushin, March 2, 1963.)

EXPORTS OF CANNED FISHERY PRODUCTS, FISCAL YEARS 1961 AND 1960:

Japan's total exports of canned fishery products in fiscal year 1961 (April 1961-March 1962) were up 4.4 percent from those in the previous fiscal year, due mainly to an increase in exports of canned tuna and horse-



Japanese fish-meal factoryship Renshin Maru operating in Bering Sea.

Consumer organizations in Japan countered with a maximum offer of 57,000 yen per metric

Japanese Canned Fishery Products Exports, Fiscal Year 1961 and 1960					
Product	FY 1961 ^{1/}				FY 1960 ^{2/}
	U. S.	Canada	Other	Total	Total
	.....(Actual Cases).....				
Crab meat	210,187	5,702	263,977	479,866	516,812
Tuna:					
In oil	-	190,138	1,312,121	1,502,259	1,322,684
" brine	2,293,958	-	-	2,293,958	2,150,548
Other types	733	6,913	260,831	268,477	118,899
Total tuna	2,294,691	197,051	1,572,952	4,064,694	3,592,131
Mackerel-pike	18,065	340	503,548	521,953	829,387
Sardine	12,669	30	273,650	286,349	569,760
Horse-mackerel	-	-	696,113	696,113	522,507
Salmon, trout	150,419	206	1,542,330	1,692,955	1,646,384
Other fish	27,307	11,253	584,685	623,245	333,131
Shellfish	307,955	133,984	73,763	515,702	509,896
Other aquatic products	10,487	250	11,268	22,005	7,396
Grand Total	3,031,780	348,816	5,522,286	8,902,882	8,527,404
^{1/} April 1961-March 1962. ^{2/}April 1960-March 1961.					

mackerel. There was a decline in exports of canned sardines, mackerel-pike, and crab meat. (Suisan Tsushin, February 8, 1963.)

FISH MEAL OFFERED FOR SALE:

A Japanese fishing company in March 1963, offered for sale about 3,000 metric tons of fish meal produced by its fish-meal factoryship Renshin Maru (14,094 gross tons) which operated off Angola in the Atlantic Ocean. The company asked 60,000 yen per metric ton (US\$151 per short ton) for its product.

ton (US\$144 per short ton). A recent price paid for Peruvian fish meal imported into Japan was reported to be 55,000 yen per metric ton (US\$138 per short ton).

According to a later report (Suisan Tsushin, March 26, 1963), the Renshin Maru returned to Tokyo on March 23, with 3,500 metric tons of fish meal. The operators, of the factoryship, according to the report have agreed in principle to sell the 3,500 tons of fish meal for 59,000 yen per metric ton (US\$149 a short ton), warehouse delivery.

Japan (Contd.):

Since February 1963, two shipments of Peruvian fish meal totaling 14,820 metric tons were imported into Japan. The second shipment of 7,750 metric tons arrived during the week of March 4. A third shipment of 7,500 metric tons was expected to arrive in Japan during early April. It is reported that the Japanese Government has approved the importation of an additional 15,000 metric tons of fish meal. (Suisan Tsushin, March 11 & 12, 1963.)

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TARGETS FOR FISH-MEAL FACTORYSHIPS IN EASTERN BERING SEA, 1963:

The combined production target of the two Japanese fish-meal factoryships which are scheduled to operate in the eastern Bering Sea in the spring and summer of 1963 is reported to be 17,800 metric tons. The factoryship Gyokuei Maru's (12,100 gross tons) target is reported to be 10,800 metric tons, and that of the Soyo Maru (11,192 gross tons) 7,000 metric tons. (Suisan Tsushin, March 30, 1963.)

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DELAY IN BERING SEA HALIBUT FISHERY ANTICIPATED:

Part of the Japanese fishing industry is concerned with the date of Canada's ratification to the recommendation of the International North Pacific Fisheries Commission which removed the halibut of the eastern Bering Sea from abstention by Japan. The Japanese were expecting the ratification by Canada to be made on March 25 but due to the political situation of Canada, which was faced with a general election on April 8, the date of ratification was expected to be delayed. This delay, according to the Japanese, may cause the loss of this year's halibut fishing season. (Japanese newspaper, March 5, 1963.)

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BERING SEA RESEARCH TO INCLUDE HALIBUT AND OTHER BOTTOMFISH:

In line with the joint conservation measures on halibut recommended by the interim meeting of the North Pacific Fisheries Commission, it was agreed to put into practice the research plans to expand the scientific basis for the preservation of all bottomfish

in the Bering Sea. The Japanese Fisheries Agency's Investigation and Research Division is studying ways and means to implement the agreement. The agreement on halibut research was for the year beginning March 25, 1963, during which investigations will be made and regulations will be recommended for use after 1964. The Fisheries Agency believes that the results of research for just one year would not be adequate and that it would be necessary to continue the investigations for several years.

The Agency has decided to carry out an investigation of other bottomfish resources in addition to the studies on halibut. Plans call for: (a) to investigate the entire area of the Bering Sea including the Gulf of Alaska; and (b) in addition to dispatching a research ship, investigators will board the motherships of the northern sea fishing fleets and instead of reports on catches by the fleets as in the past, each catcher will be directed to submit its detailed catch log. Tagging will be carried out at the same time. The sphere of the investigations call for (1) distribution of halibut, (2) conditions of halibut resources, and (3) investigation of all bottomfish other than halibut. (Suisan Tsushin, February 26, 1963.)

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LICENSES ISSUED FOR BERING SEA BOTTOMFISH FISHERY FLEET:

The Japanese Fisheries Agency late in March 1963, issued licenses for 19 mother-ships and 262 catcher vessels to participate in the 1963 Bering Sea bottomfish fishery. The catcher vessels licensed by type of gear are as follows: 101 trawl; 105 long-line; 36 combination trawl, long-line, and set net; 18 combination trawl and gill net; and 2 gill-net vessels. Of the 105 catcher vessels licensed to fish long-line only, 80 vessels are authorized to fish for halibut in the new quota area. (United States Embassy, Tokyo, March 26, 1963.)

Note: A newspaper report (Suisan Keizai Shimbun, February 27, 1963) gave a total of 19 motherships and 252 catcher vessels.

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BASES IN GHANA MAY BE AFFECTED BY COMPETITION WITH SOVIET TRAWLERS:

Since, 1961, many Japanese fishing vessels have been based in Ghanaian ports and during this period, an increased number of Soviet vessels (mostly trawlers) have ap-

Japan (Contd.):

peared on the scene. The result has been an oversupply of fish at times, which caused prices to drop. Japanese diplomatic officials in Ghana have reported the situation to their Foreign Office in Tokyo and predict that if the Soviets adopted a policy of leasing or chartering their vessels to Ghanaian interests, that the Japanese trawlers would be forced to leave Ghana. (Japanese newspaper, February 23, 1963.)

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CANADIANS PROPOSE TO EXPORT
HERRING ROE TO JAPAN:

According to a Japanese press report dated February 22, 1963, the Canadians are anxious to export herring roe to Japan. Some of the herring roe products experimentally manufactured have already arrived at Yokohama and said to be waiting for the issuance of foreign exchange allocation.

The Japanese Fisheries Agency states that because of restrictions on foreign exchange in 1962 the product was not imported, but this year there is a possibility of importing herring roe due to the improved foreign fund situation. It is likely that the Japanese Government will allocate foreign funds for the product included with other consumption items before the end of the fiscal year.

Imports of herring roe from Norway and Canada under the global quota may develop this year, but the quantities will be about 20-30 metric tons. (Suisan Tsushin, February 22, 1963.)

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ELECTRONIC TELEMETERING
WEATHER DATA SYSTEMS:

An integrated computer and telemetering weather data system was delivered to the Japan Meteorological Agency by a manufacturing company in Tokyo, according to reports. The system was operating in the Tokyo Bay area in early 1963. It has been reported that the Tokyo firm will also produce the first Japanese telemetering oceanographic buoy in accordance with international agreements on ocean buoy telemetering frequency allocation. (Newsletter, January 31, 1963, United States National Oceanographic Data Center.)

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FISHERIES LABORATORY SYSTEM
TO BE REORGANIZED:

The Japanese Fisheries Agency is planning to reorganize the regional laboratory system in fiscal year 1964 (April 1964-March 1965) in order to improve fishery research. Fishery research in Japan is conducted presently by 8 regional laboratories. Under the proposed reorganization, the existing 8 laboratories will be consolidated into 4 laboratories, and 4 special laboratories will be established to conduct research on fisheries such as salmon, king crab, bottomfish, and tuna, which are considered to be of international importance.

The Fisheries Agency hopes, by this reorganization, to improve and expand fishery research so that the Government's fishery policy will reflect more closely results of biological investigations. It was reported that in the past, the lack of well-defined research programs caused a division between research and administration which resulted in inconsistent fishery policies. For example, in 1961, the Government reportedly acted independently and without definite knowledge of fishery resources in the Bering Sea and authorized as many as 33 bottomfish fleets to operate in that area. That action resulted in the fishing ground becoming overcrowded and many fleets suffered financial losses. (Suisan Keizai Shimbun, February 5 and 28, 1963.)

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JOINT JAPANESE-PORTUGUESE
SEAWEED PROCESSING
COMPANY PLANNED:

The plan to establish a joint Japanese-Portuguese seaweed processing company with a capital of US\$400,000 has been approved by the Japanese Overseas Investment Liaison Committee. The plan is expected to be initiated without delay. The objective of the joint enterprise is to buy and process seaweeds for export as basic materials for agar agar. In the beginning, the joint company plans to produce about 1,500 metric tons. The ratio of investment will be equal between Japan and Portugal. (Suisan Tsushin, February 4, 1963.)

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OVERSEAS TRAWLERS
ASSOCIATION FORMED:

Six Japanese fishing firms have organized a group called the Overseas Trawlers Association. Officers of two of the firms were elected as president and vice president of the Association.

Japan (Contd.):

The Overseas Trawlers Association has a five-point objective: (1) promotion and maintenance of goodwill in foreign countries; (2) rational utilization of overseas bases; (3) investigation and development of resources; (4) promotion, expansion, and stabilization of foreign markets; and (5) stabilization of management relations.

The 6 firms comprising the Association membership own a total of 30 trawlers, 28 of which are in actual operation, almost all of which operate in the Atlantic Ocean. Besides the 28 vessels, one of the member firms is reported to be constructing two 2,500-ton trawlers which are expected to be completed in 1963. Another firm is reported constructing four stern trawlers of over 2,600 tons each, and a 3,000-ton trawler is to be built by another firm. In addition, it was reported that plans call for converting the tuna mother-ship Tenyo Maru No. 3 (3,800 gross tons) into a stern trawler when she returns from the South Pacific tuna fishing grounds. All those vessels are expected to be sent to the Atlantic Ocean when completed.

Distant-Water Trawler Fleet of Overseas Trawlers Association			
Vessel	Gross Tons	Area of Operation	Year Constructed
Asama Maru . . .	993	Atlantic Ocean	1954
Ikoma Maru . . .	995	" "	1954
Amaqi Maru . . .	2,249	" "	1960
Ibuki Maru . . .	2,503	" "	1961
Unzen Maru . . .	2,525	" "	1962
Hidehiko Maru . .	2,525	" "	1962
Oe Maru	2,525	" "	1962
Kaibun Maru . . .	2,518	" "	1962
Taiyo Maru:			
No. 56	774	Atlantic Ocean	1954
" 57	774	South Pacific	1954
" 61	1,497	Atlantic Ocean	1957
" 62	1,482	" "	1960
" 63	1,482	" "	1960
" 65	1,829	" "	1960
" 66	1,829	" "	1960
" 67	1,484	" "	1961
" 68	1,498	" "	1961
" 71	1,475	" "	1962
" 72	1,498	" "	1962
" 73	1,495	" "	1962
Akebono Maru:			
No. 50	1,409	Atlantic Ocean	1961
" 51	1,459	Bering Sea	1961
" 52	1,471	" "	1962
" 53 ¹	1,451	Atlantic Ocean	1962
Daishin Maru:			
No. 10	1,493	Atlantic Ocean	1962
" 11	1,494	" "	1962
Nichinan Maru . .	2,518	Atlantic Ocean	1962
Aoi Maru No. 2 . .	1,474	Atlantic Ocean	1962
¹ /Originally licensed to operate in Bering Sea but diverted to Atlantic Ocean in September 1962.			

Of those trawlers operating in the Atlantic Ocean, all except one are fishing off West Africa. The exception is the Aoi Maru No. 2 (1,474 gross tons) which has been fishing for cod out of St. Pierre, off the coast of Newfoundland. The Association members are watching the performance of the Aoi Maru with great interest, and several members are reported already to have submitted applications to the Fisheries Agency to engage in the northwest Atlantic fishery.

The Japanese Atlantic trawl fleet operates principally out of Las Palmas, Canary Islands, as do many of the Japanese tuna vessels fishing in the tropical Atlantic. Because of the large number of Japanese fishing vessels calling at Las Palmas, the Association plans to request the Japanese Government to establish a Consulate in that port. (Suisan Shuho, February 5; Shin Suisan Shimbun Sokuho, February 7, 1963, and other sources.)

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VESSEL LEAVES FOR
ECUADORAN BASE:

As a result of negotiations between Japanese and Ecuadoran fishing interests that began in 1962, the Japanese vessel Daijin Maru No. 7 of Choshi Chiba Prefecture was due to sail for Ecuador late in February 1963. The vessel will fish (hook and line) for skipjack tuna and trawl for shrimp for the next 3 years. Catches will be sent to a freezing plant at Quito, Ecuador, and the frozen shrimp will be exported to the United States.

The Daijin Maru No. 7 has shifted her operations from the North Pacific salmon fishery in which it participated as a catcher vessel belonging to the Koyo Maru fleet. (Fisheries Economic News, January 26, 1963.)

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VESSELS AND CREWS SEIZED BY
FOREIGN COUNTRIES IN 1962:

The Japanese Maritime Safety Agency has reported on Japanese fishing vessels seized by foreign countries in 1962. Seizures amounted to 104 vessels with 1,016 crewmen. While the number of captured vessels decreased, that of crew members increased by 10 percent over the previous year. Vessel seizures by Spanish Africa, Ecuador, and Alaska were the first in recent years.

The Agency, in warning pelagic fishing vessels of an increasing number of countries now insisting on wider territorial waters, pointed out the importance of: (1) care should be taken to prevent suspected intrusion of territorial waters not recognized by Japan, and (2) complete procedures for an emergency call at a foreign port necessitated by rough weather or unexpected sickness. The status of vessel seizures in 1962 is as follows:

Soviet Union: 72 vessels, 506 personnel (89 vessels, 579 personnel, the previous year), representing 70 percent of the total number of vessels. Around Habomai, Shikotan Islands, off the eastern tip of Hokkaido, 58 vessels were seized, followed by 8 off the southern coast of Saghalin. Last year 26 vessels and 422 crew members were released but 134 members were still held as of the end of 1962.

South Korea: 15 vessels 116 crew members. The seizure of large-sized vessels such as trawlers decreased in 1962 while that of small-sized (less than 20 ton vessels) such as hook and line vessels increased. This is attributed to the fact that wireless equipment on large-sized vessels is improving and warning from the Agency's patrol boats is becoming efficient enough to reach all of those vessels. A total of 57 vessels succeeded in eluding Korean pursuers or twice as many as in the previous year. As of the end of 1962, 27 crew members were still held.

There were no seizure cases by Taiwan and Red China during 1962. Two vessels with 24 men were seized by North Korea; 7 vessels, 99 men, by the United States (off Alaska and around the Bonin Islands); 3 vessels, 87 men, by Ecuador; 3 vessels, 83 men, by Indonesia; 1 vessel, 47 men by the Philippines; and 1 vessel, 54 men, by Spanish Africa. With the exception of being fined, immediate release took place of the vessels and crew members by the 3 captured by the United States and 2 by Ecuador. As of the early part of 1963, two vessels with 24 men were reported seized by the Soviet Union, and 2 vessels with 19 men, by South Korea. (Japanese newspaper, February 25, 1963.)

Jordan

FISH LANDINGS INCREASE IN 1962:

Fishery landings during 1962 in Jordan are officially estimated at 185.8 metric tons, a sharp rise from the 138.2 tons landed in 1961. Although the landings still supply only about $\frac{1}{5}$ of the domestic consumption, there is hope that recent economic agreements with Saudi Arabia will result in Jordan obtaining fishing rights in rich Saudi waters, and that modest foreign exchange savings will result. (United States Embassy, Amman, March 15, 1963.)



Malagasy Republic

TERRITORIAL WATERS EXTENDED TO 12 MILES:

The Malagasy Government's decision fixing the territorial waters of Madagascar at 12 miles has been made effective by Presidential Decree No. 63-131 signed February 27, 1963, and published in the Journal Officiel de la Republique Malgache, March 9, 1963.

Two supplementary governmental orders regulate the use of explosives for underwater research and the conditions of passage and anchorage for foreign fishing vessels in Malagasy territorial waters.

A recent unauthorized visit by 15 Soviet fishing vessels to a remote point on the Malagasy Coast brought home to the Republic's Government the need to establish the new coastal limits. (United States Embassy, Tananarive, March 2 and April 6, 1963.)



Malaya

FISHING VESSELS BARRED FROM INDONESIAN TERRITORIAL WATERS:

The Indonesian Navy announced on February 20, 1963, that "any Malayan fishing boat caught in Indonesian waters will be burned on the spot." The announcement was received with consternation by Malayan west coast fishermen, but press interviews with the fishermen indicate that they will obey the edict. According to a spokesman for fishermen in the Selangor area, the abandon-

ing of the "traditional" fishing grounds off Sumatra will mean a significant drop in income because the fish are larger and more plentiful off the Sumatran coast, but this is preferable to the loss of nets and vessels.

The Royal Malayan Navy has ordered Malayan fishing boats to stay out of Indonesian waters and ships are patrolling at strategic points to offer the Malayan vessels protection. However, there are 2,000 to 3,000 fishing vessels which the Royal Malayan Navy has announced cannot be given "individual protection" and they can be given "none at all if they enter Indonesian territorial waters." (United States Embassy, Kuala Lumpur, March 5, 1963.)

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JOINT MALAYAN-JAPANESE TUNA- PROCESSING FIRM EXPANDS:

A spokesman for a jointly owned Malayan-Japanese tuna-processing firm reported that the company is planning a big increase in its shipments of frozen tuna to the United States and Japan this year.

A consignment to the United States in January amounted to 500 tons of frozen tuna and in February another 500 tons were exported. Shipments to Japan amounted to 700 tons in January and 700 tons in February.

The company's new canning plant on River Road, Penang, is nearing completion and when production starts, the output is expected to increase threefold. Canning at present is being carried out at another factory on Patani Road with output at 150 cases a day.

Production of tuna sausages for the Malayan market has been stopped since April 1962, because the demand is light as the Malaysians are not accustomed to eating tuna. (Japanese newspaper, February 13, 1963.)



Mexico

SOVIET TRAWLERS FROM CUBAN BASES REPROVISION AT VERACRUZ:

Two more Soviet trawlers arrived in Veracruz, Mexico, in January 1963 to reprovision--the Olenij on January 15, and the Ochotsk on January 12. They took aboard a normal supply of food, estimated to

Mexico (Contd.):

be sufficient for about 15 days, for about 25 men on each vessel.

The frequent arrivals of Soviet trawlers provoked some comment in a Veracruz newspaper on January 18. It was noted that the vessels are using Veracruz for what amounts to a resupply base, causing speculation as to conditions in Cuba that force the trawlers to use a Mexican port for resupply. The newspaper questioned why that port is used exclusively since the ports of Progreso and Coatzacoalcas are equally adapted to filling the needs of the vessels and may be closer to their areas of operations. The newspaper made the observation that the Russians, while fluent in Spanish, are reluctant to talk about their fishing activities. (United States Consul, Veracruz, January 27, 1963.)



Morocco

CANNED FISH EXPORTS AT RECORD LEVEL AS OF DECEMBER 1962:

Exports of canned fish by Morocco, after a slow start in the 1962/63 marketing season, were higher at the end of December than the previous record 1961/62 season (1,878,520 cases as compared with 1,699,111 cases). December exports of 381,098 cases set a new all-time high for any one month. Sardine (the leading canned fish product) exports in December increased 9.2 percent. Canned tuna exports rose 47 percent (220,938 cases as compared with 150,449 cases).

Sardine exports to Cuba through early October 1962 amounted to 187,329 cases as compared with 30,000 cases in 1961. These exports reflected Morocco's attempt to balance bilaterally its heavy sugar imports. Another large shipment of 90,000 cases to the U.S.S.R. was reported in December. Exports to France as of October 31, remained the same (about 500,000 cases), while shipments to Ghana dropped sharply to 100,024 cases from 218,713 cases.

Moroccan exports of frozen sardines to France caused rioting in fishing centers in Brittany in the summer of 1962. In the trade agreements made with France in December 1962, the French free entry quota was reduced from 8,500 metric tons to 7,500 tons of frozen sardines, with the further provi-

sion that Moroccan exports would be suspended during the length of the French summer sardine fishing season. The 1,000-ton reduction in frozen sardine exports may be used for the export of other fish to France. (United States Embassy, Rabat, February 21, 1963.)



Netherlands

RESULTS OF 1961/1962 ANTARCTIC WHALING SEASON UNFAVORABLE:

During the 1961/1962 Antarctic whaling season the catch of the Netherlands' whaling expedition, headed by the factoryship Willem Barendsz, amounted to 614.8 blue whale units, down sharply from the previous season. The catch was announced by the Netherlands Whaling Company in its annual report for the fiscal year July 1961-June 1962. The company reported a deficit of about fl.4.9 million (US\$1,360,000) at the end of the 1961/1962 fiscal year. During that fiscal year, income totaled fl.12.3 million (US\$3,420,000) as compared with fl.21.7 million (US\$6,030,000) in the previous fiscal year. The management attributed the drop in income to (1) lower whale oil production and (2) a sharp drop in whale oil prices as a result of competitive pressure from Peruvian fish oil.

Production of the Netherlands Whaling Company's Factoryship Willem Barendsz, 1960/1961 and 1961/1962

Product	1961/1962 Season1/			1960/1961 Season2/		
	Quan- tity	Average Sales Price		Quan- tity	Average Sales Price	
	Metric Tons	Fl./ Metric Ton	US\$ Metric Ton	Metric Tons	Fl./ Metric Ton	US\$ Metric Ton
Whale oil	12,084	467	130	21,667	739	205
Sperm oil	2,915	769	214	1,702	696	193
Whale meal	1,742	550	153	4,156	398	111
Whale meat ^{3/}	1,220	808	224	2,137	748	208
Whale liver	417	909	253	519	898	249

1/Antarctic season opened December 12, 1961 and closed April 15, 1962.

2/Antarctic season opened November 28, 1960 and closed April 6, 1961.

3/Two Japanese freezer ships working with the Willem Barendsz froze an additional 8,175 tons of whale meat which was shipped to England.

The Willem Barendsz, accompanied by 11 catcher vessels, renewed Antarctic operations on December 12, 1962. Only one Japanese freezer ship, the 7,000-ton Awazu Maru, is working with the Netherlands' expedition this season. The production of the Willem Barendsz as of February 17, 1963, was reported as follows (figures in parentheses give production during the comparable period in the 1961/1962 season): whale oil, 7,841 metric tons (7,632 tons); sperm oil 2,254 tons (1,749

Netherlands (Contd.):

tons); fish meal, 840 tons (1,087 tons); and frozen whale meat, 355 tons (941 tons). The expected production of whale meat and sperm oil during the 1962/1963 season is reported to have been sold in advance. (United States Consulate, Amsterdam, February 25, 1963.)

Notes: (1) Netherlands guilders 3.6 equals US\$1.00.

(2) See Commercial Fisheries Review, July 1962 p. 87, April 1961 p. 73.



Northern Rhodesia

BRITISH MAY AID LAKE KARIBA FISHERIES DEVELOPMENT:

It is likely that Northern Rhodesia will get assistance from the Freedom from Hunger Campaign amounting to about £260,200 (US\$728,000) for five projects.

Included in that sum is an application for financial assistance for the training of fishermen and the development of Lake Kariba fisheries at a cost of £40,000 (US\$112,000) which has been adopted by the Freedom from Hunger Campaign Committee in the British City of Nottingham. It includes a fisheries' training project and the provision of a fund from which loans can be made to fishermen for the purchase of gear. (United States Consulate General, Salisbury, April 1, 1963.)



Norway

EXPORTS OF CANNED FISH, JANUARY-OCTOBER 1962:

During January-October 1962, Norway's total exports of canned fish showed an increase of 12.5 percent in quantity and 15.8 percent in value over exports in the same period of 1961, due mainly to an increase in exports to the United States and the United Kingdom.

Norway's Total Exports of Canned Fish, January-October 1961-62 ^{1/}			
Year	Quantity	Value	
		Metric Tons	Million N. Kr. Million US\$
1962	25,868	130.8	18.3
1961	23,000	113.0	15.8

^{1/}Preliminary.

The United States was the leading buyer of Norwegian canned fish during January-October 1962, taking 43.2 percent of total exports, or 11,186 metric tons valued at N. kroner 58.0 million (US\$8.1 million) as compared with 8,949

tons valued at N. kroner 47.8 million (US\$6.7 million) during the same period of 1961. Other important markets for Norwegian canned fish in 1962 were the United Kingdom, Australia, Canada, East Germany, and South Africa.

The 1962 brisling pack amounted to 417,918 standard cases (100 3-3/4-oz. cans), as compared with 431,366 standard cases in 1961.

The 1962 pack of kippered herring from the winter sild catch totaled 429,105 standard cases (100 3-1/4-oz. cans), as compared with 188,000 standard cases in 1961. An annual pack of about 400,000 cases of kippered herring is considered normal in Norway.

In 1962, the pack of canned shrimp declined, but the pack of canned crab was about equal to that in 1961. Canned anchovy production increased in 1962, while the pack of other sild delicatessen specialties was about the same as in 1961.

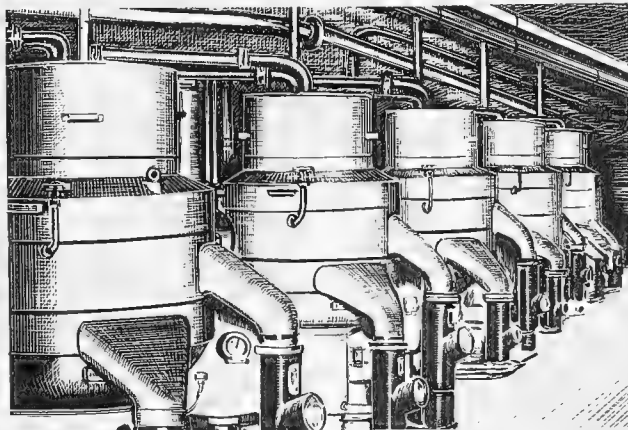
Production costs in Norwegian canneries are increasing and competition for foreign markets is becoming tighter, according to the Norwegian Canners National Association. Adjustments in the external tariffs of European Common Market countries have had an unfavorable effect on Norwegian canned fish exports to those countries. On the other hand, reductions in internal tariffs between European Free Trade Association countries have been helpful to some Norwegian exporters. The Norwegian canning industry is said to favor full membership in the European Common Market for Norway. (Norwegian Canners Export Journal, January 1963.

Note: Norwegian kroner 7.15 equals US\$1.00.

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FISHERIES LANDINGS, 1960-1962:

Norwegian fisheries landings in 1962 were down 15.4 percent in quantity and 5.0 percent in value from those in 1961, according to preliminary data. The decline was due mainly to the almost complete failure of the capelin (smelt) fishery and lower cod landings. The 1962 spring cod fishery off the coast of north Norway attracted only a little more than half as many fishermen as in 1961. But good catches of cod off Greenland, Iceland, and Bear Island helped bolster the fishery in 1962.



One type of centrifuges used for producing fish oils.

Norway (Contd.):

Norwegian Fishery Landings, 1960-1962									
Species	1962			1961			1/1960		
	Quantity	Value		Quantity	Value		Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000
Fish:									
Winter herring	84,068	33,150	4,636	69,042	24,732	3,459	300,143	89,684	12,543
Other herring & sprat .	488,059	140,483	19,648	483,740	142,728	19,962	398,231	108,156	15,127
Total herring . . .	572,127	173,633	24,284	552,782	167,460	23,421	698,374	197,840	27,670
Capelin (smelt) . . .	363	59	8	217,168	28,782	4,025	92,765	10,399	1,454
Cod	200,051	182,160	25,477	234,531	217,672	30,444	213,439	186,611	26,099
Haddock	44,285	37,383	5,228	46,791	37,037	5,180	38,359	29,076	4,067
Halibut ^{2/}	4,775	16,861	2,358	4,056	14,933	2,089	5,663	18,867	2,639
Saithe	79,176	43,549	6,091	66,340	37,097	5,188	77,864	43,657	6,106
Mackerel	16,885	13,435	1,879	15,003	11,493	1,607	19,737	12,354	1,728
Tuna	6,814	13,002	1,818	6,639	11,162	1,561	3,280	5,802	811
Other species	133,767	100,010	13,987	112,932	91,643	12,817	135,739	99,727	13,948
Total fish	1,058,243	580,092	81,130	1,256,242	617,279	86,332	1,285,220	604,333	84,522
Fish livers and roe . .	20,545	10,244	1,433	32,560	15,937	2,229	29,950	15,360	2,148
Shellfish:									
Shrimp	10,504	40,696	5,692	10,036	31,899	4,461	9,616	29,977	4,193
Lobster	500	7,686	1,075	681	9,249	1,294	787	10,038	1,404
Crab	3,633	2,273	318	4,062	2,531	354	3,958	2,291	320
Squid	6,018	1,981	277	-	-	-	278	33	5
Total shellfish . . .	20,655	52,636	7,362	14,779	43,679	6,109	14,639	42,339	5,922
Seaweed, dried . . .	14,000	2,500	350	13,000	2,550	357	13,004	2,554	357
Total landings . . .	1,113,433	645,472	90,275	1,316,581	679,445	95,027	1,342,813	664,586	92,949
1/Preliminary									
2/Does not include the lower valued "Greenland halibut."									
Note: Norwegian kroner 7.15 equals US\$1.00.									

The total herring catch in 1962 was 3.4 percent above that in 1961. There was a substantial increase in landings of herring for reduction into meal and oil, due mainly to a better Norwegian catch of summer herring in Icelandic waters. The 1962 winter herring catch was only slightly better than that for 1961.

The Norwegian shrimp catch was at a record level in 1962. (Norwegian Fishing and Maritime News.)

Note: See Commercial Fisheries Review, August 1962 p. 84.

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FISHERIES TRENDS, MARCH 1963:

Winter Herring: The winter herring fishery off west Norway in 1963 ended with a total catch of only 57,000 metric tons--the poorest results since 1902. A few years ago, the fishery produced daily landings of 60,000 tons.

Cod Fishery: Reports from north Norway indicate that the Lofoten cod fishery will be a failure this year. Despite favorable weather, cod fishermen were returning from the banks day after day with very little fish. In March 1963, after 7 weeks of fishing, only 13,604 tons had been landed, a decline of over 10,000 tons from the catch in the same period of 1962. There was no prospect of any substantial improvement in the fishery.

Whaling: By March 9, 1963, Norway's Antarctic whaling expedition had produced 180,000 barrels of whale and sperm oil, down 27.2 percent from the 247,315 barrels produced during the comparable period of the 1961/1962 season. Norway had 4 factoryships operating in the Antarctic at the start of the current season, but 1 of those vessels was damaged by a storm and has not been in operation since January 28, 1963. (News of Norway, March 21 and 28, 1963.)

Note: See Commercial Fisheries Review, April 1963 pp. 66-67.

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FISHERMEN'S 1961 AVERAGE EARNINGS:

A statistical study of Norwegian fishermen's earnings in 1961, covering 6 percent of all professional fishermen in Norway, showed an average annual income of Kr. 8,192 (US\$1,146). In 1961, over 30 percent of Norway's fishermen earned more than Kr. 10,000 (\$1,399), about 32 percent earned between Kr. 6,000-10,000 (\$839-1,399), and 37 percent earned less. (News of Norway, February 28, 1963.)

Notes: (1) Norwegian kroner 7.15 equals US\$1.00.

(2) See Commercial Fisheries Review, Aug. 1962 p. 84.

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FUTURE TRENDS IN FISHERIES INDICATE NEED FOR MODERN DEEP-SEA FLEET:

In 1962, Norwegian fishermen landed 1,113,443 metric tons of fish valued at 645.5

Norway (Contd.):

million kroner (US\$90.3 million). The landings decreased by 203,138 tons, and the value by 34 million kroner (\$4.8 million) from 1961. The chief reason for the drop in the 1962 landings was the failure of the capelin fishery. The shrimp fishery had record landings and the Norwegian freezing plants' organization increased their exports of frozen fishery products to about 40,000 tons. This organization exported frozen fishery products to 30 foreign markets including the United States which took more than 11,000 tons.

In spite of the lower landings, the Norwegian authorities are by no means pessimistic about the future of the Norwegian fisheries. It is recognized that rationalization is necessary for economical operation of the fleet. The Norwegian Minister of Fishery, states that the main problem has for the past few years been to compensate for the decrease in seasonal and coastal fisheries. While large fishing vessels have been able to change over to deep-sea fishing, small and medium fishing vessels are unable to do so.

He pointed out the necessity of constructing a modern fishing fleet to engage in coastal and seasonal fisheries when conditions are favorable, and fishing in distant waters when this appears to be advantageous. In May 1962, the Fishery Department appointed a committee with the task of working out a program for the reorganization of the deep-sea fishing fleet. The committee's recommendation will be decided upon by the authorities in the near future. In the course of the first three years, old and unserviceable fishing vessels will be replaced by modern vessels. For the past 2 to 3 years the Norwegian Government has supported the construction of a number of new stern trawlers from 400 to 1,000 tons. After those "trial fishing vessels" have been in operation for some time and their effectiveness and profitability have been thoroughly studied, greater investments will be made in a development program for the trawler and deep-sea fishing fleet. The development program will in turn lead to important structural changes in the Norwegian fisheries. (Norwegian Fishing and Maritime News, No. 4, 1962.)

* * * * *

CANNING SCHOOL AND LABORATORY SUPPORTED BY CANNING INDUSTRY:

The Norwegian Canning School is attracting considerable attention. Designed and

equipped to provide a well rounded education in all aspects of canning, it is located in Stavanger near the research laboratory of the Norwegian canning industry. Stavanger is also the home of Norway's largest packer of canned fish.

When the Norwegian Canning School opened in 1952, the emphasis was mainly on fish. It now covers the whole field of canning, including meat, fish, fruits, and vegetables. The school combines theoretical instruction with practical work in classrooms, chemical and bacteriological laboratories, and a small scale cannery equipped with the latest in automated machinery. Here, students pack anywhere from 120 to 150 different products. They also study physics, chemistry, bacteriology, hygiene, production planning, merchandising, practical canning, engineering, and plant management.

Students, who must be at least 17 years of age, are not required to have worked in a cannery. Elementary school graduates attend a 2-year course, while those who have finished high school need only take a 1-year course. There is no tuition, and nearly all educational material is provided free of charge. Out-of-town students live in a dormitory where the fee for room and board is kept very low.

Since the school was started by the Norwegian Cannery Association slightly over 10 years ago, some 300 students have graduated. Presently, the school has 26 students from many parts of Norway. The school is financed by a small tax on all canned goods sold in Norway.

The research laboratory which the Norwegian canning industry maintains in Stavanger was established in 1931. Supervised by a board of industry and Government representatives, it is organized in three departments for chemical, bacteriological, and engineering research. The investigations conducted by the laboratory have had a wide range. The nutritional value of canned foods as well as production methods have been studied. Tests have been carried out to develop new products. A great deal of work has also been done to establish quality control and specifications for the canning industry's most important raw materials. Quality control is now carried out by an independent department of the laboratory. (News of Norway, March 14, 1963.)

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Norway (Contd.):

DRIED COD CONTRIBUTED TO
WORLD FOOD PROGRAM:

In response to a request from the Food and Agriculture Organization (FAO), Norway planned to ship 50 tons of dried cod in early 1963, to Dar-es-Salam, Tanganyika, to help feed Ruandan refugees. The shipment was to be part of Norway's contribution to the World Food Program conducted under the sponsorship of the United Nations and FAO. (News of Norway, March 14, 1963.)

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NEW SONIC FISHING AIDS MARKETED:

A fully transistorized low-cost echosounder for smaller fishing vessels has been introduced by an electronics firm in Oslo, Norway. The device can detect fish down to some 850 fathoms, or by the flip of a switch, at much shallower depths. It is designed for installation at the front of the wheelhouse, so that the captain can watch the sounder for signs of fish while steering his vessel.

For larger fishing vessels, the Norwegian firm is offering a new fully automatic ASDIC (sonar) for trawlers and line-fishing vessels between 40 and 70 feet long. This instrument has a range of about 4,000 feet under normal conditions. Operating on a frequency of 50 kilocycles, it is immune to interference from other ASDICS or sounders.

The Oslo company maintains about 250 stations in foreign countries to provide service for its products. (News of Norway, March 21, 1963.)

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POWER BLOCK PROVES SUCCESSFUL
IN HERRING SEINE FISHERY:

During the 1962 Icelandic herring fishery three Norwegian purse seiners were equipped with U. S. type power blocks. All three vessels made good catches, and a number of Norwegian fishing vessel owners have now ordered power blocks or are considering the changeover to this fishing method.

The chief fisherman aboard one of the three vessels stated:

"Norwegian fishermen might have saved millions of kroner if they had taken on power block and ring seine some years ago. After our experiences during the Icelandic fishery we do no longer doubt that this is the gear of the future for Norwegian fishermen."



Peru

ANCHOVY FISHERMEN'S TIE-UP
UNSETTLED AS OF MARCH 1, 1963:

The important fishing industry was facing its greatest crisis since February 1962 due to the continuation of the tie-up of anchoveta fishermen and vessels which began on January 31, 1963.

Financial losses to the industry and the Government were mounting, and a general moratorium on the industry's financial obligations has been requested. The Lima Chamber of Commerce has asked financial institutions to be as lenient as possible in such matters.

There are two aspects of the situation--the fishermen's demands and the 25-sol (about 93 U. S. cents) per short-ton tax imposed on anchoveta landings used for reduction. Until the vessel operators know how the tax is to be applied, they cannot enter into a settlement with the fishermen. Meetings were being held constantly by all elements involved, including the Government. Although references to negotiated settlements of both phases of the problem have been noted, as of March 1, no definite solutions have been announced. (United States Embassy, Lima, March 1, 1963.)

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FISH-MEAL MAJOR INDUSTRY
IN NORTHERN AREA:

The fish-meal industry is the principal topic of conversation in fisheries circles in northern Peru. Chimbote--the northernmost city where the industry is important--is booming. The population there now is about 120,000 (less than 10,000 in 1950), mostly living in straw-mat houses and employed or seeking employment in the fishing industry. Some 48 fish-meal plants reportedly are in operation or under construction in Chimbote alone. There are a few further north, 2 in Casma (3 under construction), and 9 in Chiclaya (with 10 planned immediately south of the present plants).

The two largest equipment suppliers are both Lima firms. The principal equipment supplied includes cookers, presses, dryers, and cyclones. Both of the firms will undertake to equip a 10- to 20-ton per hour plant costing from 500,000 soles (US\$18,643) to 800,000 soles (US\$29,828). Boilers, engines, and buildings are not included. All material, except engines, are produced in Peru. Plants of this kind (which represent

Peru (Contd.):

more than 50 percent of the fish-meal plants in Peru) are uneconomical to operate and wasteful (fish body oil is not removed), but they do make money at present prices. The larger and more modern plants are more elaborately equipped, with most of the equipment custom-built locally. Special equipment is required for oil processing and it is brought in principally from Norway and Denmark. The larger plants produce an estimated 70 percent of the fish meal, and can be expected to ride out depressed conditions which would ruin the smaller operators. Most plants canning fish (tuna or bonito) are closing because of depressed prices, high costs, and the more advantageous use of equipment in supplying anchoveta to fish-meal plants.



Fig. 1 - A typical small purse-seiner of the anchoveta fleet waiting to unload.



Fig. 2 - The fish are being pumped from the boat to a waiting truck.

Large numbers of fishing boats were seen in the various ports waiting to unload their anchoveta catches. Sufficient facilities still are not available to process all of the anchoveta being caught. Although few plants exist north of Chimbote, fishermen at Santa Rosa (near Trujillo) reported that considerable

numbers of anchoveta exist there. One flock of sea birds flying up the coast of that area was observed that must have numbered 500,000. With this much bird life, large numbers of anchoveta must also be present. Little concern about conservation measures was expressed. (United States Embassy in Lima, March 13, 1963.)

Editor's Note: The above was reported by an officer of the United States Embassy following a trip to observe economic conditions in northern Peru. His trip preceded the late January tie-up of the anchovy fishing fleet.

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EXPORTS OF PRINCIPAL MARINE PRODUCTS, 1961-62:

Exports of fish meal by Peru in 1962 rose 49.1 percent in quantity and 101.6 percent in value as compared with the preceding year. The average export value in 1962 was about US\$94.61 a metric ton (\$85.83 a short ton), up sharply from the average of \$69.96 a metric ton (\$63.58 a short ton) realized in 1961 and reflected the stronger worldwide market for fish meal in 1962.

Exports of fish oil in 1962 of 127,969 tons increased 25.1 percent from the 102,306 tons exported in 1961. The average value of fish oil exports, however, increased only 6.8 percent in 1962 from the preceding year. Fish oil exports in 1962 averaged only 4.1 cents a pound, down about 14.6 percent from the 4.8 cents a pound average in 1961.

Peruvian Exports of Principal Marine Products, 1961-62						
Item	Qty.	1962		Qty.	1961	
		Metric Tons	Value 1/		Metric Tons	Value 1/
			US\$ 1,000			US\$ 1,000
Fish meal . .	1,055,883	2,678.3	99,899	708,366	1,328.6	49,556
Fish oil . . .	127,969	310.7	11,589	102,306	290.8	10,847
Fish (froze., canned, etc.)	35,829	226.7	8,456	39,449	255.0	9,511
Fertilizer (guano) . . .	15,351	39.9	1,488	15,861	41.6	1,552
Sperm oil . .	9,336	34.5	1,287	9,063	33.7	1,257
Whale meal . .	3,765	6.4	239	5,147	7.0	261

1/F.o.b. values converted at rate of 26.81 soles equal US\$1.

In 1962, exports of sperm oil were about unchanged in both quantity and value, but the exports of fish (frozen, canned, etc.) dropped 9.2 percent in quantity, and the exports of whale meal were down 26.9 percent in quantity from the preceding year. (United States Embassy, Lima, March 21, 1963.)



Poland

FLEET OF LARGE WIDE-RANGING FREEZERSHIPS NEEDED TO RAISE FISH CATCH:

In its March 1 issue, a Polish periodical continued its promotion of a larger and more competitive Polish fishing fleet. The periodical poses the question: What is the likelihood of Poland's achieving its planned increase in catch during the next 17 years? Its answer: Not so good--in fact, impossible under present conditions.

Poland (Contd.):

The goals of the Polish fishing industry are impressive. From 169,000 metric tons of fish in 1961 and "several thousand less than that in 1962," fishermen are asked to bring in 325,000 tons in 1965, 500,000 in 1970, and 900,000 in 1980. To achieve anything even approaching those goals two things are necessary according to the article: (1) new fishing grounds, and (2) a modern fleet built to operate in such waters. In other words, a long distance fleet with modern equipment will be needed to gather Poland's share of the catch from the constantly receding Atlantic grounds. So far, the article states, not much is being done to build such a fleet.

According to the article, last autumn's cruise of the trawlers *Odn* and *Gryf* is given as an example of the "economic nonsense" which characterizes Poland's present effort. Those 2 vessels loaded up with 250 tons of fish in 5 days fishing off Capo Blanco, but took 25 days for the round trip to those waters. How much better it would be, the article pointed out, if trawlers could stay out for a whole month and then bring in up to 1,500 tons. Simple arithmetic shows the advantage of this system, but the article suggests that some interests are preventing the construction of the refrigerator ships, the fish storage and processing trawlers and other vessels. Present plans for the expansion of such a fishing fleet are insufficient to achieve the announced goals the article states, and ends by criticizing the Ministry of Shipping for hesitating to make additional investments in the fleet. (United States Consul, Poznan, March 11, 1963.)



Portugal

PRODUCTION AND EXPORTS OF MARINE OILS; EXPORTS OF FISH MEAL, 1959-1961:

Marine Oils: The annual total output of marine oils in Portugal between 1959 and 1961 showed little change. A noticeable increase in production of cod-liver oil in 1961 was offset by a decline in the production of other fish-liver oils and whale oil.

Export data in 1961 generally reflected production trends. Shipments of sardine oil

and cod-liver oil were up substantially, but exports of other fish-liver oils and whale oil were down sharply. Total exports of Portuguese marine oils in 1961 were 13.5 percent below those in 1960.

Table 1 - Portuguese Production and Exports of Marine Oils, by Product, 1959-1961

Item	1961	1960	1959
	(Metric Tons)		
Production:			
Sardine oil	2,790	2,700	2,440
Cod-liver oil	3,800	3,150	2,430
Other fish-liver oils	1,557	2,000	3,000
Whale and sperm oil	2,360	2,630	2,600
Total Production	10,507	10,480	10,470
Exports:			
Sardine oil	3,470	2,631	2,820
Cod-liver oil	3,280	1,850	2,310
Other fish-liver oils	120	1,850	2,890
Whale and sperm oil	2,150	4,100	3,100
Total Exports	9,020	10,431	11,120

West Germany was the leading buyer of Portuguese cod-liver oil in 1961 with 1,940 tons, followed by the United States with 806 tons. West Germany was also the leading market for Portuguese sardine oil.

Table 2 - Portuguese Exports of Sardine Oil, by Country, 1959-1961

Country	1961	1960	1959
	(Metric Tons)		
West Germany	1,652	1,734	1,465
Netherlands	46	409	635
Norway	761	282	273
France	430	7	406
Other Countries	581	199	40
Total	3,470	2,631	2,819

Fish Meal: Portuguese exports of fish meal showed a sharp increase in both 1960

Table 3 - Portuguese Exports of Fish Meal, by Country, 1959-1961

Country	1961	1960	1959
	(Metric Tons)		
West Germany	4,000	1,852	47
Greece	177	177	290
Netherlands	49	0	138
Spain	120	0	0
Portuguese Overseas Provinces	2	4	4
Other Countries	147	259	52
Total Exports	4,495	2,292	531

and 1961, due mainly to greater shipments to West Germany. (United States Embassy, Lisbon, March 6, 1963.)

Note: See Commercial Fisheries Review, October 1960 p. 82.



Rhodesia and Nyasaland Federation

FISH PROCESSING RESEARCH AND FISH FARMING POTENTIAL, EARLY 1963:

The possibility of producing caviar from the roe of carp caught in landlocked Rhodesia

Rhodesia and Nyasaland Federation (Contd.):

is being investigated at the Fisheries Research Center of the Rhodesian Federal Ministry of Agriculture. A Government Fisheries Officer said he thought it would also be possible to make caviar from the roe of other fish species. He said that smoking and other methods of preserving fish were also being studied.

The Fisheries Officer said that there was plenty of opportunity and potential for fish farming in the Federation, which in 1962 imported fishery products with a total value of £1,250,000 (US\$3,500,000). The value of the main categories of fishery products imported in 1962 were: fresh, chilled, or frozen fish--£400,600 (\$1,121,680); preserved fish--£302,000 (\$845,600); salted, dried, or smoked fish--£214,500 (\$600,600); and shellfish--£23,500 (\$65,800).

In addition to Lake Kariba (the world's largest man-made lake), Rhodesia has over 50,000 acres in lakes and ponds created by farm dams and other artificial means. An additional 100,000 acres are expected to be placed under water by projects planned for the near future. All of those waters can be used to some extent for fish culture.

The Fisheries Officer said that the production of one ton of fish per acre was a realistic possibility with intensive pond fish culture. He said, "Optimum management and improved conditions for fish rearing can result in the production of increasing amounts of fish for internal consumption. Although many of the waters that are exploited merely supply local consumption--because of the difficulties of preserving and transporting--they have a hidden value. Where the labor force are allowed to fish the dams, it provides a strong attraction to farm workers and makes a material contribution to their food supplies." (The South African Shipping News and Fishing Industry Review, January 1963.)



Senegal

TUNA LANDED BY FOREIGN VESSELS FOR FREEZING, 1962:

Tuna landed at Dakar by foreign fleets (other than French or Senegalese) is either transshipped or frozen and then shipped, both

operations taking place outside the customs barrier. Complete statistics on such tuna are not available. The Statistical Service of the Port of Dakar reports that in 1962 only two countries, Japan and Spain, landed tuna for freezing in Senegal for reshipment. For Japan this amounted to 468.8 metric tons, and for Spain 162.7 tons.

Tuna entering Senegal, not covered by the Franco-Senegalese agreement, carries customs duties amounting to 33.3 percent ad valorem. Tuna entering the country under the agreement is not dutiable. (United States Embassy, Dakar, March 5, 1963.)



Singapore

FISH AND SHRIMP PONDS TO BE ESTABLISHED IN RECLAIMED SWAMPLAND:

The Singapore Government plans over a 4-year period to reclaim 4,000 acres of swamp-land at a cost of M\$4.5 million and convert it into farmland, fish and shrimp ponds to provide employment for some 1,600 people. At present a pilot project of 176 acres is under way at Sugei Poyan. When the entire project is completed, it is planned that 1,000 acres will be used for cultivating leaf vegetables, 1,000 acres for shrimp ponds, and about 2,000 acres for fish ponds.

The Government plans to set up a cooperative to run the shrimp and fish ponds in the reclaimed area. Some 38 squatter families will be moved off the land and resettled elsewhere. The next step after the pilot project will be the reclamation of 760 acres in the neighboring areas, beginning with Sungei Berih. (United States Consul, Singapore, March 16, 1963.)



South Africa Republic

EXPANSION OF TRAWLER FLEET PLANNED BY LARGE FISHERY GROUP:

A large South African fishing industry group is planning a big increase in its fishing activities. Bids are being sought from British and Dutch shipyards for up to 20 new 100-foot trawlers which will join the group's fleet at Hout Bay, Capetown.

South Africa Republic (Contd.):

Two new ventures started in the Republic have combined in producing frozen fish from the group's Hout Bay plant. This production is being marketed locally throughout Cape Province. The present fleet of 5 vessels may shortly be augmented by the arrival of 3 second-hand trawlers under negotiation from a British trawling firm.

Beyond confirming that the 20 trawlers were planned, an official of the group in London would give no further details. But fishing authorities believe that part of the plan is to catch and process South African hake before freezing and exporting this variety to New Zealand.

As the fishing area is so near to the South African coast, it is not planned at this stage to use the trawlers in connection with a fleet fish-factory processing ship, as the length of their trips will not be more than 10 days. (World Fishing, March 1963.)

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PILCHARD-MAASBANKER FISHERY, 1962:

The South Africa Republic west coast landings of pilchards in the January-July 1962 season totaled 452,735 short tons, according to the latest data available. The 1962 pilchard landings from South-West

During the main fishing season in January-July 1962, the Cape fishery also caught 69,439 tons of maasbanker (jack mackerel) and 23,395 tons of mackerel. Added to the pilchard landings (452,735 tons), this brought the Cape shoal fish landings for the season to 545,569 tons. Data on landings of maasbanker and mackerel by Cape vessels for the second season in November-December 1962 were not reported. Adding the 1962 South-West Africa pilchard landings of 436,068 tons, the total landings for the fishery were about one million tons.

Excluding production from Cape landings in November and December, the 1962 pilchard-maasbanker-mackerel fishery yielded 4,836,493 cases of canned fish, 222,235 short tons of fish meal, and 58,057 long tons of fish body oil. Of the total, 3,882,723 cases of canned fish, 97,479 short tons of fish meal, and 23,428 long tons of fish body oil were produced in the 6 Walvis Bay factories of South-West Africa. The remainder was produced in the 14 Cape west coast factories of the South Africa Republic.

The January 1963 landings by the South African pilchard fleet of nearly 140 vessels were expected to equal the landings in the first month of 1962. Fish schools were plentiful in the False Bay area, but were scarce north of Cape Town, according to early reports. (The South African Shipping



A Cape west coast pilchard and maasbanker cannery and fish reduction plant.

Africa's Walvis Bay amounted to 436,068 tons, or combined total pilchard landings of 888,803 tons--67,272 tons more than the record 1961 season landings.

News and Fishing Industry Review, January 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 114.

South Africa Republic and South-West Africa

SPINY LOBSTER EXPORT TRENDS:

South Africa is not in a position to produce and export unlimited quantities of spiny lobster tails as seems to be the general belief in the United States. The statement was made by the Chairman of South African Frozen Rock Lobster Packers (Pty) Ltd. and South-West Africa Frozen Rock Lobster Packers (Pty) Ltd. while on a visit to the United States. In an interview held on March 1, 1963, he outlined the position of the South African spiny lobster industry in general, and gave an explanation of its relationship to the United States market.

In his interview he stated that "Under the South African Government regulations, promulgated many years ago, a Government conservation program was instituted limiting the catch and export of this commodity. Our Government has always considered our fishing grounds as a natural resource which should be given every opportunity to be maintained and protected for the years that lay ahead; The industry has worked with our Department of Fisheries in close collaboration, and the existing fishing regulations are a result of mutual consideration of the problems presented all in the interests of South Africa."



Fig. 1 - View of the unloading of South African rock lobster tails at port of entry.

He said "The main features of our Government regulations are: (1) A limitation on the size of rock lobster permitted to be caught; (2) The proclaiming of sanctuaries where no fishing is permitted; and (3) Prohibition of catching rock lobster in 'berry' (breeding) at any time. These plus the fact that nature, which under our weather conditions, permits only about 150 days fishing per year makes it a real challenge for the producer in fulfilling the quota granted by the Government.

"The maximum permissible export quantity for the year 1963 from the Republic is 6.8 million pounds and from South-West Africa 3.6 million pounds. The aforementioned figures can only be reached subject to good fishing weather and other conditions which are beyond our control, but we can never exceed the quantities mentioned.

"Because of the excellent quality and the desired sizes of rock lobster tails which are produced in the waters of the Republic of South Africa, almost the entire quantity are marketed in the United States, and are distributed mainly to the institutional trade, such as hotels, restaurants, and clubs, as well as to the consumer. The quality of rock lobster tails produced in the waters of South-West Africa are of identical

species to those produced in the Republic except, by nature, the sizes are smaller and because of that, marketing of this product is not directed only to the United States. Approximately a half million pounds of the total South-West African quota is utilized for canning purposes, which product sells in the United States, France, England, and many other Western European countries; a further half million pounds of this quota is marketed in France in fresh frozen form. The balance is exported to the United States where it is used mainly in consumer packages under various well established brands.



Fig. 2 - Pallets containing South African rock lobster tails being lifted out of hold of vessel onto pier.

"Over the past six months or so, the South African industry has also been experimenting by air-freighting live rock lobster to France. These experiments are proving successful. Every week approximately 6,000 pounds of live rock lobster are flown from Cape Town to Paris.

"Additional experiments are also being made to produce and ship whole cooked, frozen rock lobster, and several small consignments have been shipped to Western Europe, the result of which at this stage are not known as yet, but I confidently believe they will prove equally successful.

"We are very proud of our market in the United States developed over a period of 25 years, first serving the East Coast and gradually expanding because of ready acceptance of our product to where we now serve several of the larger distribution centers across the nation.

"In the post-war years, advertising and public relations programs spread the news of our product so that enumerable users became repeated supporters of South African rock lobster tails.

"The foregoing affords you a well-rounded out picture of what we, the producers, are faced with and what has taken place here in the United States. Taking all these factors into consideration: (1) Strict Government regulations for conser-

South Africa Republic and South-West Africa (Contd.):



Fig. 3 - Stacking of pallets with cartons of South African rock lobster on pier prior to loading into trucks.

vation; (2) Ability to catch the amount of the permissible quota; and (3) The maintaining of traditional and opening of new European outlets--only one conclusion can be drawn.

"Our industry will continue exporting to our staunch supporters--the American market--but we regret that the quantity cannot be increased and must be held within the limitations placed upon us as I have outlined in these remarks."



South-West Africa

POLISH STERN TRAWLER VISITS WALVIS BAY FOR SUPPLIES:

During December last year, the 2,880-gross-ton Polish stern trawler Neptun called at Walvis Bay, South-West Africa, for stores and oil. The Neptun, which is owned by a fishing company in Gdynia, Poland, had been operating on the same fishing grounds as the Russians, the Kunene River mouth on the northern border of South-West Africa.

According to her skipper, the vessel was on her maiden voyage and at that time was the only Polish fishing ship operating in those waters. He stated that they had already caught more than 900 tons of fish which had been frozen or processed into fish meal. The frozen fish was to be sold in Nigeria and the fish meal taken back to Poland.

In addition to the 100 Polish crew members, there were also 16 Nigerians who had been engaged when the vessel had called earlier at Lagos on her outward voyage.

The Neptun was not connected, nor was she fishing with the Russian fleet trawling in the same waters.

It is understood that there are now six Polish trawlers operating off South-West Africa and that some of the vessels were due to call at Walvis Bay during February to take on stores and oil. (The South African Shipping News and Fishing Industry Review, February 1963.)

Note: See Commercial Fisheries Review, February 1963 p. 87.



United Kingdom

ABERDEEN TRAWLERS SEEK NEW FISHING GROUNDS IN DEEP WATER:

The Aberdeen trawler Summerlee returned on January 22, 1963, from an experimental trip to the deep-water zone between the Shetland Islands and Norway with 380 boxes of fish valued at over £1,800 (US\$5,040). This was the best in a series of experimental trips undertaken to find new fishing grounds which will offset the proposed extension of the Faroese fishing limits.

A spokesman for the White Fish Authority, which is participating in the experiments, said that the result was very encouraging. He said that the vessel fished at depths of 90-170 fathoms and could, if necessary, have fished at 200 fathoms. The catch was mainly large whiting, cod, and ling. Haddock had been very scarce. Dutch, German, and French trawlers were fishing in the area.

The factor of importance in these tests is in the depth fished. In the past, the Scottish trawler fleet has taken the view that it could not work successfully in really deep water. Most of the trawling was done at a maximum depth of 70 fathoms.

With the new type of French gear there would appear to be no good reason why the fleet should not move into deeper water and thus greatly increase the area in which it can work. The Summerlee and another Aberdeen trawler have been making this type of experiment for several months. They have made successful trips to Atlantic deep-water grounds.

The Summerlee will make another trip to the same area, after which the White Fish Authority will issue a report to trawler own-

United Kingdom (Contd.):

ers on the entire project. The Authority has shared the cost of the experiments with the Aberdeen Fishing Vessel Owners' Association and the Department of Agriculture and Fisheries. (Fish Trades Gazette, January 26, 1963.)

BOXING FISH AT SEA IMPROVES QUALITY:

Boxing fresh fish at sea protects the fish from crushing, speeds unloading, and prevents damage by hooks, according to a British fishery firm in Hull. Boxing fish at sea was tried aboard a British distant-water trawler during a 3,400-mile round trip to Greenland. Some of the boxed fish was 16 day old when landed by the vessel. Its good quality convinced the British firm to apply the boxing system to some of its other vessels. (Fish Trades Gazette, January 26, 1963.)

POSTGRADUATE TRAINING IN FISHERY RESEARCH AIDED BY GRANTS:

Postgraduate training grants in fishery research, effective October 1, 1963, are to be

awarded by the British Development Commission in association with the Ministry of Agriculture and Fisheries and the Department of Agriculture and Fisheries for Scotland.

To attract students it is intended to widen the field of study to include such subjects as mathematics, physics, geography, and engineering.

The grants are intended to enable selected candidates to undergo a specified course of training to fit them for the investigation of problems in marine or freshwater science.

The Commissioners will consider applications from candidates for permission to register for a higher degree in circumstances where this seems likely to be consistent with the requirements of the approved fishery research training program.

Awards do not carry any guarantee of subsequent employment nor do they entail any obligation to accept such employment, but the training should fit students for employment either in the fishery research service or in a marine or freshwater biological research institution. (Fishing News, recent date.)

LARGE GLACIAL BOULDER LANDED BY BRITISH TRAWLER

An outsize, $2\frac{1}{2}$ -ton, glacial boulder, believed to be the largest ever raised off the sea bed by conventional trawl gear, was landed at Grimsby in early December 1962 by the British trawler Ross Mallard.

Caught off the Dogger Bank, and sharing the same net with seven baskets of plaice and soles, this gigantic rock would still be a menace to trawlermen were it not for the great strength of the polypropylene cod end which the Ross Mallard was using. That the cod end is still fit for service should dispel any doubts about the strength of this synthetic material.

Speculation is inevitable. From the firm that owns the trawler comes the estimate that the boulder--a deposit from melting glacial ice of the Ice Age--has probably gone through a thousand cod ends.



The $2\frac{1}{2}$ -ton glacial boulder being exhibited by the captain of the trawler Ross Mallard.



FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

ALASKA ICE AND COLD-STORAGE FIRM AWARDED LOAN FOR PLANT EXPANSION:

A \$260,000 industrial loan application from the Alaska Ice and Storage, Inc., Kodiak, Alaska, has been approved by the Area Redevelopment Administration (ARA) of the Department of Commerce. The loan is to help finance a \$400,000 plant expansion program for storing and processing fish. In the past, Alaska Ice and Storage, Inc., has handled limited quantities of salmon and halibut during the fishing season. The expanded facilities will make it possible for the firm to almost double its capacity and in addition to salmon and halibut will be able to handle king and Dungeness crab and shrimp. With the new facilities, the operation will be on a more or less year-round basis.

The expanded operation will provide employment for about 120 people in Kodiak. It is estimated that at least 60 additional jobs will be created in the allied trades and services that support the fishing industry of this officially designated redevelopment area. This investment of Federal funds is expected to make a real contribution to the local Kodiak economy, as well as that of Alaska.



Department of Health, Education and Welfare

FOOD AND DRUG ADMINISTRATION

PERMISSION TO WEIGH PACKAGED FROZEN FISH FILLETS AT TIME OF SALE PROPOSED:

In a "statement of general policy or interpretation," the U. S. Food and Drug Administration announced on November 28, 1962 (Fed-

eral Register, December 4, 1962), the cancellation of the exemption to producers of individually-or-consumer-wrapped frozen fish fillets to omit the net-weight statement on the wrappers of fish fillets that are prepackaged in cellophane or similar films. Since April 25, 1940, the producers of individually wrapped frozen fillets have been permitted to substitute statements or instructions on the label with the following: "that the article is to be weighed and marked at time of retail sale." On April 4, 1963 (Federal Register, April 10, 1963), the Food and Drug Administration after considering additional data supplied by the fishing industry on past and current trade practices in the marketing of certain types of frozen fish fillets, announced a proposal to continue the exemption from the net weight labeling law. The announcement dated April 4, 1963, as it appeared in the April 10, 1963, Federal Register follows:

DEPARTMENT OF HEALTH, EDU- CATION, AND WELFARE

Food and Drug Administration

[21 CFR Part 1]

WRAPPED FISH FILLETS

Proposed Exemption From Certain Labeling Requirements

Following publication in the FEDERAL REGISTER of December 4, 1962 (27 F.R. 11943), of the policy statement § 3.204 *Net weight statement on foods in package form that may be weighed at time of retail sale*, representatives of the fishery industry supplied additional data about past and current trade practices in the marketing of certain types of frozen fish fillets. Acting on this and other information, the Commissioner of Food and Drugs has concluded that a special exempting provision should be added to the regulations implementing section 405 of the Federal Food, Drug, and Cosmetic Act.

Therefore, the Commissioner, under the authority provided in the Federal Food, Drug, and Cosmetic Act (secs. 403 (e) (2), 405, 701(a), 52 Stat. 1046 as amended, 1049, 1055; 21 U.S.C. 343(e) (2), 345, 371(a)), and delegated to him by the Secretary of Health, Education, and Welfare (25 F.R. 8625), proposes to amend § 1.13 *Food; exemptions from labeling requirements* by adding a new paragraph (g), as follows:

§ 1.13 Food; exemptions from labeling requirements.

(g) Wrapped fish fillets of nonuniform weight intended to be unpacked and marked with the correct net weight at the point of retail sale at an establishment other than where originally packed, shall be exempt from the requirements of section 403(e)(2) of the act during introduction and movement in interstate commerce and while held for sale prior to weighing and marking, if the outside container bears a label declaration of the total net weight, the individual packages bear a conspicuous statement "To be weighed at time of sale," and it is the practice in the retail establishment to weigh and mark the individual packages with a net-weight statement at the time of sale. The act of delivering the wrapped fish fillets at time of retail sale without the correct net-weight statement shall be deemed an act which results in the product being misbranded while held for sale.

Any interested person may, within 30 days from the publication of this notice in the FEDERAL REGISTER, submit written views and comments on this proposal. Such comments should be submitted in triplicate and addressed to the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C.

Dated: April 4, 1963.

GEO. P. LARRICK,
Commissioner of Food and Drugs.



Interstate Commerce Commission

HEARINGS ON MOTOR CARRIER RATES FOR FISH AND SHELLFISH SCHEDULED:

On the request of the railroads, the Interstate Commerce Commission (ICC) has begun an investigation of the motor carriers' rate structure for fish and shellfish and certain other formerly exempt commodities. The investigation is not limited to grandfather rates; it applies to all common carrier rates. It appears that some interests wish to have all motor carrier rates fixed at a minimum level based on the operating costs of large general commodity haulers.

The first in a series of country-wide hearings in ICC Docket 32912--Rates on Formerly Exempt Commodities--was held in Washington, D. C., March 11-14, 1963, to introduce the ICC's cost study and to hear the Eastern motor carriers' defense of their rates. The next hearing was tentatively scheduled for April 17 in Atlanta, Ga., for evidence on Southern regional costs and rates. Additional hearings were planned in Kansas City, Kans.,

on April 22, and Los Angeles, Calif., on April 29. Hearings were also planned in San Francisco, Calif., and Portland, Oreg., after which a final hearing will be held in Washington, D. C.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

NEW MINIMUM WAGE RATES FOR TUNA CANNERY WORKS IN PUERTO RICO ANNOUNCED:

A new minimum wage rate of \$1.25 per hour for the tuna-canning industry in Puerto Rico, will become effective November 3, 1963. The new rate was announced on March 23, 1963, by the U. S. Labor Department's Wage and Hour and Public Contracts Divisions. The current minimum wage for tuna cannery workers in Puerto Rico, is \$1.15 per hour.

The new rate reflects the 10-percent automatic increase for industries in Puerto Rico, prescribed by the 1961 amendments to the Fair Labor Standards Act. The amendments provide that employers in Puerto Rico can apply to the Secretary of Labor for appointment of a review committee to recommend minimum wage rates to be paid in lieu of the rates resulting from the 10-percent statutory increase. Such applications must be filed with the Secretary of Labor between July 6, and September 4, 1963.

Note: See *Commercial Fisheries Review*, February 1963, p. 94, October 1961, p. 86, and August 1961, p. 98.



White House

ACCEPTS RECOMMENDATION TO PERMIT JAPANESE TO FISH FOR HALIBUT IN EASTERN BERING SEA:

The President on March 23, 1963, took action in accordance with the North Pacific Fisheries Act of 1954, to accept the recommendation of the International North Pacific Fisheries Commission which, if accepted by Canada, Japan, and the United States, will permit the Japanese to fish for halibut in the Eastern Bering Sea along with United States and Canadian fishermen. A statement issued

from the White House said, "In reaching this decision, we have not only taken into account our international obligations, but also the domestic factors which have come to our attention. We consider that this action advances the cause of the principle of abstention which is at the heart of the Tripartite Fisheries Treaty of 1952, and which provides a reasonable, workable, and essential procedure for dealing with certain major North Pacific Fisheries problems. We are determined to work for the continuation of this principle and of the Treaty in which it is set forth. We are cognizant of the Commission's recent successful efforts to develop conservation measures which, if accepted by the three parties to the Tripartite Fisheries Treaty, will provide suitable protection for Eastern Bering Sea halibut. This action will not take effect until the Canadian Government takes similar action."



Eighty-Eighth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as

well as signature into law or other final disposition are covered.

ALASKA FISHING LIMITS: The House on Apr. 8, 1963, and the Senate on Apr. 9, 1963, were presented with a resolution from the Senate of the State of Alaska (Senate Joint Resolution 10), relating to the territorial waters of Alaska. The resolution states the fisheries abutting the Alaska coast are of enormous economic value and represent the sole source of livelihood for scores of American nationals; American nationals have fished for years under carefully planned and stringent conservation regulations imposed to insure maximum sustained yield from the resource; recent years have seen an increased amount of foreign fishing effort in the waters surrounding the Alaska coast; the alien fishermen fish entirely free of conservation restrictions imposed on American citizens; that the U. S. Government, charged with the obligation of protecting American fisheries from foreign encroachment, has taken insufficient action to protect the resource either through assertion of a greater territorial belt of water than 3 miles or application of the so-called base line method already sanctioned for use by the International Court of Justice; and the Governor

of the State of Alaska has attempted unceasingly to impress upon the U. S. Government the gravity of intrusions by foreign nationals into waters historically considered American and the necessity of establishing a broad claim to waters adjoining the Alaska coast; and the Governor, faced with the complete lack of action on the part of the U. S. Government, has acted courageously in protecting the fisheries of Alaska through State action which circumstances required. Referred to the Senate Committee on Commerce and the House Committee on Merchant Marine and Fisheries.

ANTIDUMPING ACT AMENDMENT: S. 1318 (Humphrey et al) introduced in Senate Apr. 11, 1963, to amend the Antidumping Act 1921; referred to the Committee on Finance. The objective of the U. S. Antidumping Act is to prevent foreign manufacturers from injuring American industries by dumping surplus merchandise here at prices below those charged in the exporting country. If the Treasury Department finds a price differential, and the Tariff Commission finds an American industry is injured, the foreign manufacturer must pay the differential to the Treasury in dumping duties. The bill would make the Act more effective in achieving its original purpose and to help insure that international trade will be conducted in a fair and equitable manner. Would also prevent Soviet bloc exports from disrupting free world trade. Companion bills introduced in the House Apr. 11, 1963, were: H. R. 5693 (Thompson), H. R. 5694 (Byrne), H. R. 5695 (Curtin), H. R. 5696 (Daniels), H. R. 5697 (Dent), H. R. 5698 (Ding), H. R. 5699 (Milliken), H. R. 5700 (Philbin), and H. R. 5701 (Tupper); all referred to the House Committee on Ways and Means.

ATOMIC ENERGY COMMISSION: S. Doc. 6, Annual Report to Congress of the Atomic Energy Commission for 1962 (U. S. Senate 88th Congress, 1st Session), 621 pp., printed. Contains the reports on the Commission action, nuclear power programs, production and weapons program; other major programs; and regulatory activities. Included is a report of the program on the radiation pasteurization of food. Research results obtained thus far in the Commission's 5-year research and development program indicate that radiation is effective for preserving foods in the manner envisioned, such as low doses of radiation, etc. Some of the foods thus far tested with good results have been strawberries, peaches, haddock, and clams. The first public display of low-dose radiation-pasteurized food was made during the year at the Fifth International Food Congress and Exhibition in New York City. The items displayed were fish and fruit products--crab, shrimp, flounder, strawberries, grapes, lemons, and nectarines. The Bureau of Commercial Fisheries Technological Laboratories at Gloucester, Mass. and Seattle, Wash., are coordinating with the Commission on various studies being made on clams, haddock, crab, and flounder.

CHEMICAL PESTICIDES COORDINATION: S. 1250 (Neuberger) introduced in Senate Apr. 2, 1963, to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls; referred to Committee on Commerce. Also H. R. 5589 (Conte) introduced in House Apr. 10, 1963; referred to House Committee on Merchant Marine and Fisheries.

S. 1251 (Neuberger) introduced in Senate Apr. 2, 1963, to amend the act of August 1, 1958, in order to

prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides; referred to Committee on Commerce. Also H. R. 5588 (Conte) introduced in the House on Apr. 10, 1963; referred to House Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES FUND: The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce held hearings on Apr. 24 and 25, on S. 627, to amend the Act of August 11, 1939, relating to domestically produced fishery products to establish a fund for the advance of commercial fisheries.

H. R. 5539 (Bonner) and H. R. 5561 (Bates) introduced in House Apr. 9, 1963, to promote State commercial fishery research and development projects, and for other purposes; both referred to the Committee on Merchant Marine and Fisheries.

COMMODITY PACKAGING AND LABELING: H. R. 5331 (Kastenmeier) introduced in House Apr. 1, 1963, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; referred to Committee on the Judiciary. Also H. R. 5027 (Gilbert) introduced in the House Mar. 21, 1963; to Committee on the Judiciary.

DELAWARE RIVER BASIN: H. Doc. 522, Volume VII, Delaware River Basin, New York, New Jersey, Pennsylvania, and Delaware (Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated April 2, 1962, submitting a report, together with accompanying papers and illustrations, on a review of the Delaware River and tributaries, requested by a resolution of the Committee on Public Works, United States Senate, adopted April 13, 1950, and other resolutions of that Committee of the Committee on Public Works, House of Representatives, listed in the report, House of Representatives, 87th Congress, 2nd Session), 176 pp., illus., printed. Contains Appendix N, General Geology and Ground Water, a report by the U. S. Geological Survey for and in cooperation with the Corps of Engineers, as a guide to the better understanding of the Delaware River service area.

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The House Committee on Interstate and Foreign Commerce began hearings on Apr. 30, 1963, on H. R. 4700, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes.

H. R. 5201 (Harris) introduced in House Mar. 28, 1963, to amend Section 203 (b) (6) of the Interstate Commerce Act, as amended, so as to limit the application of the exemptions provided therein, and for other purposes; referred to the Committee on Interstate and Foreign Commerce. The present law provides the exemption for "motor vehicles used in carrying property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof), if such vehicles are not used in carrying any other property, or passengers, for compensation. . . ." The bill changes this language to read "motor vehicles or combinations thereof having together a total of not more than three axles used in carrying property con-

sisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof), if such motor vehicles or combinations thereof are not used in carrying any other property, or passengers, for compensation."

The Subcommittee on Surface Transportation of the Senate Committee on Commerce began hearings on May 6, 1963, on S. 1061, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers.

FISHERY MARKETING ACT AMENDMENT: The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce held hearings on May 8, 1963, on S. 1135, to make clear that fishermen's organizations, regardless of their technical legal status have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1964: The House on Apr. 2, 1963, passed by voice vote H. R. 5279, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1964, and for other purposes. Included are funds for the Fish and Wildlife Service, its two bureaus, Commercial Fisheries and Sport Fisheries and Wildlife, and the Office of the Commissioner. The Senate on Apr. 3, 1963, received the bill from the House and referred it to the Committee on Appropriations.

MEDICAL CARE FOR VESSEL PERSONNEL: The Senate on Apr. 15, 1963, was presented with a resolution of the Senate of the State of Alaska (Senate Resolution 58) urging Congress to approve the restoration of medical care rights to owner-operators of vessels and self-employed seamen by the passage of H. R. 2108, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel. Referred to the Senate Committee on Commerce.

The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce held hearings on Apr. 24 and 25, 1963, on S. 978, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel.

The House on Apr. 22, 1963, was presented with a resolution of the Senate of the State of Alaska memorializing the President and the Congress of the United States relative to restoration of Federal medical care for persons employed or engaged on vessels; referred to the Committee on Interstate and Foreign Commerce. This resolution urges Congress to approve passage of H. R. 2108, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel.

METRIC SYSTEM STUDY: S. 1278 (Pell) introduced in Senate Apr. 4, 1963, to provide that the National Bureau of Standards shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures; referred to the Committee on Aeronautical and Space Sciences. In the Senate on Apr. 22, 1963, Senator Neuberger was added as additional co-sponsor of the bill.

OUTDOOR RECREATION BUREAU: H. Rept. 160, Promoting the Coordination and Development of Effective Programs Relating to Outdoor Recreation (A report from the House Committee on Interior and Insular Affairs, to accompany H. R. 1762), 9 pp., printed. The Committee favorably reported the bill with amendments and recommended passage. Contains purpose and background; contents of the bill, Committee amendments; and costs.

The House Committee on Rules Apr. 4, 1963, reported H. Res. 306, for consideration of H. R. 1762, to promote the coordination and development of effective Federal and State programs relating to outdoor recreation, and for other purposes; referred to the House Calendar. This is an open rule providing for the consideration of and 1 hour debate on H. R. 1762.

PACIFIC ISLANDS TRUST TERRITORY DEVELOPMENT: House Committee on Interior and Insular Affairs held hearings on Apr. 29-30, 1963, on H. R. 3198, to promote the economic and social development of the Trust Territory of the Pacific Islands, and for other purposes. Bill would amend the Tariff Act of 1930 to consider the Pacific Trust Territory as an insular possession of the United States in regard to duty-free importation into the U. S. This provision, however, would not apply to fishery products processed in the Trust Territory unless such fish were landed from U. S. flag vessels or Trust Territory vessels "Manned by crews, two-thirds of which are citizens of the U. S. or the Trust Territory."

SANITATION REGULATIONS FOR IMPORTED SHELLFISH: H. R. 1770 (Colmer) introduced in House Jan. 14, 1963, to amend the Public Health Service Act to provide for certain investigations and studies by the Surgeon General of the United States. Provides for investigations and studies in foreign countries relating to sanitary control of the shellfish industries. It would prohibit importation of shellfish from any country in which sanitary standards and practices are lower than the minimum requirements prescribed by the Public Health Service for the United States industry. Bill was referred to the Committee on Interstate and Foreign Commerce.

STERN RAMP TRAWLER: The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce held hearings on Apr. 24 and 25, 1963, on S. 744, to authorize the Secretary of the Interior to construct 2 modern stern ramp trawlers to be used for research, and for other purposes. The House on Apr. 8, 1963, and the Senate on Apr. 9, 1963, were presented with a resolution of the Senate of the State of Alaska (Senate Joint Resolution 21), urging Congress to act favorably on S. 744, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for research, and other purposes. The resolution states: the high-seas fish resources of the United States are being ravaged by fleets of modern trawlers operated by foreign nations; the fishing fleets of the U. S. have never received the attention and encouragement necessary to permit our fishermen to compete successfully with the vast, effi-

cient and modern foreign fleets; and the construction by the Federal Government of two stern ramp trawlers would make available American vessels which could be used for exploratory and scientific investigations of the fisheries resources of the high seas. Referred to the Senate Committee on Commerce, and the House Committee on Merchant Marine and Fisheries.

SUPPLEMENTAL APPROPRIATIONS FY 1963: H. R. 5517 (Thomas) introduced in House Apr. 5, 1963. The bill was reported favorably (H. Rept. 198), to the House by the Committee on Appropriations on the same day. Included are funds for the Department of the Interior. The Committee recommended \$658,400 for the Bureau of Commercial Fisheries, including the budget estimate of \$400,000 for research and development on processes to produce fish protein concentrate and \$258,400 to cover part of the cost of pay increases. The House on Apr. 10, 1963, passed by a voice vote H. R. 5517. The Senate Apr. 11, 1963, received from the House H. R. 5517; referred to the Senate Committee on Appropriations.

H. Rept. 198, Supplemental Appropriation Bill, 1963 (Apr. 5, 1963, report from the Committee on Appropriations, House of Representatives, 88th Congress, 1st Session to accompany H. R. 5517), 27 pp., printed. The Committee considered budget estimates of \$1,641,507,106 and has recommended for appropriation \$988,756,506. Included are funds for the Bureau of Commercial Fisheries, the Committee recommended \$400,000 for research and development on processes to produce fish protein concentrate and \$258,400 to cover part of the cost of pay increases.

TRANSPORTATION ACT OF 1963: The House Committee on Interstate and Foreign Commerce began hearings on Apr. 30, 1963, on H. R. 4701, to provide for strengthening and improving the national transportation system and for other purposes.

The Subcommittee on Surface Transportation of the Senate Committee on Commerce began hearings on May 6, 1963, on S. 1062, to provide for strengthening and improving the national transportation system and for other purposes.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce began hearings May 7, 1963, on S. 1006, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes.

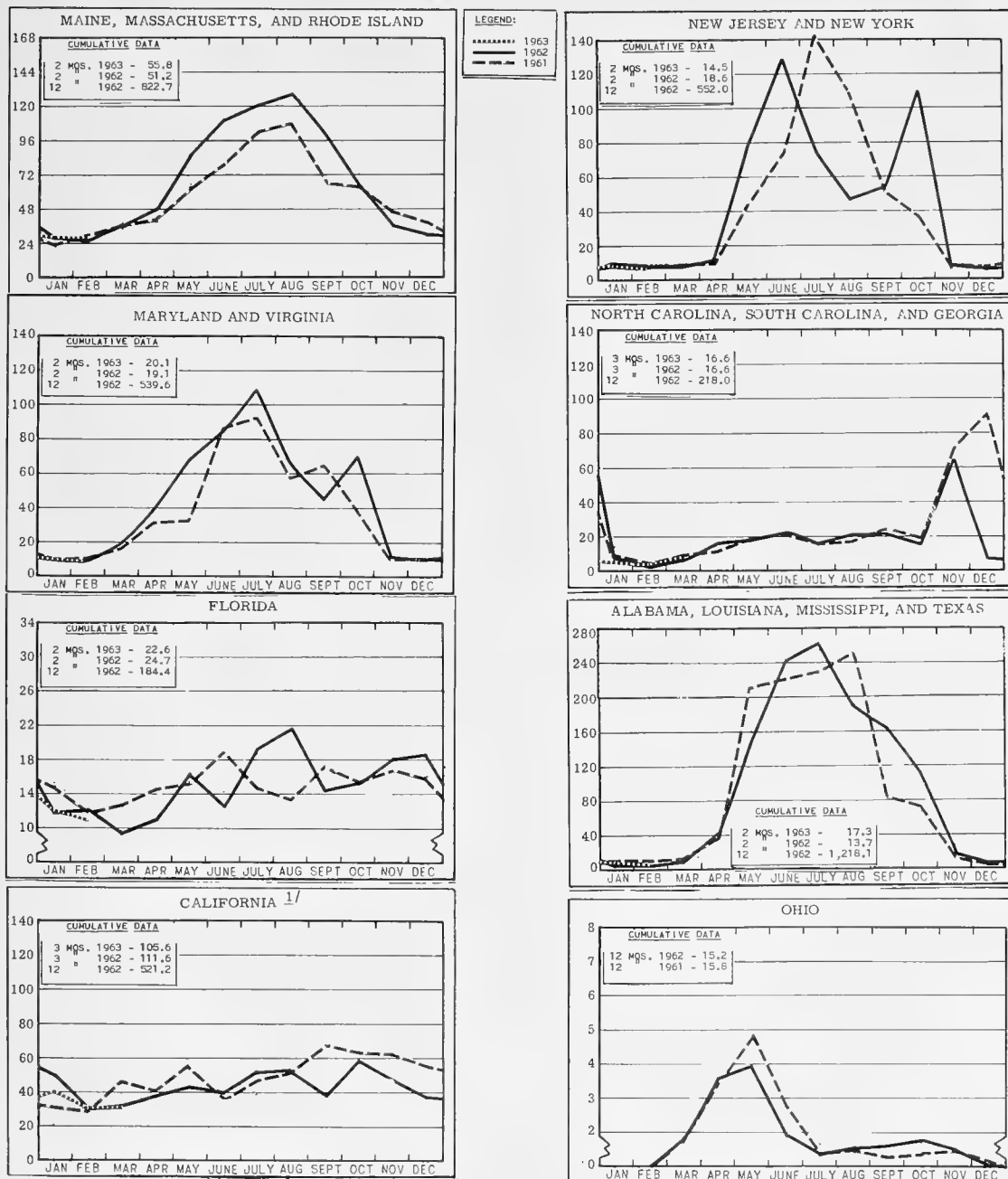
WATER POLLUTION CONTROL ADMINISTRATION: H. R. 5740 (Rodino) introduced in Senate Apr. 22, 1963, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes; referred to the Committee on Public Works.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

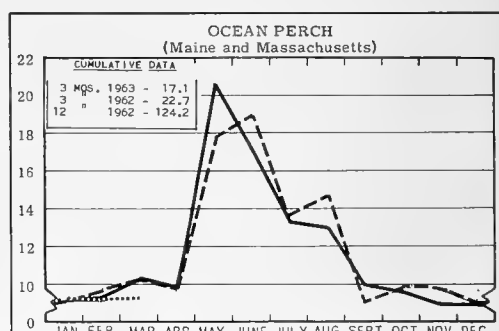
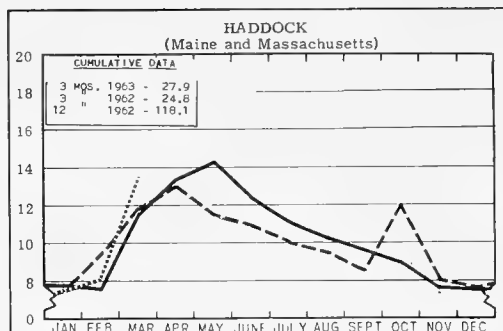
In Millions of Pounds



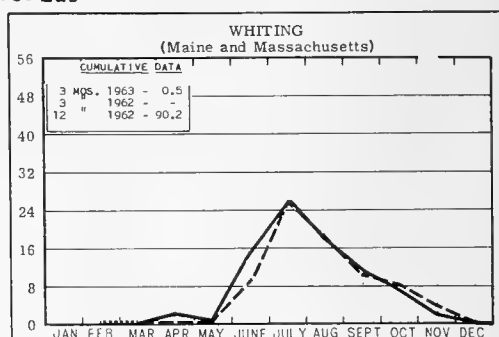
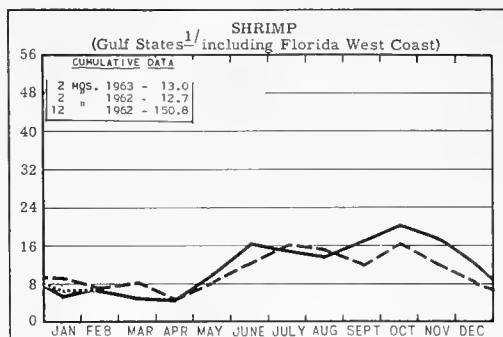
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

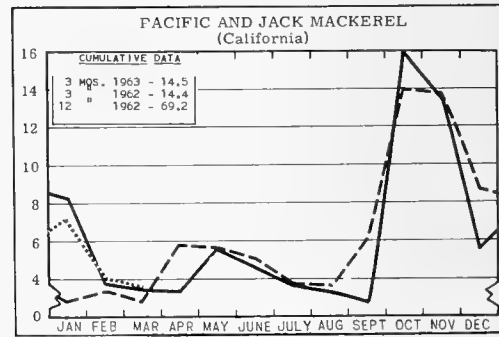
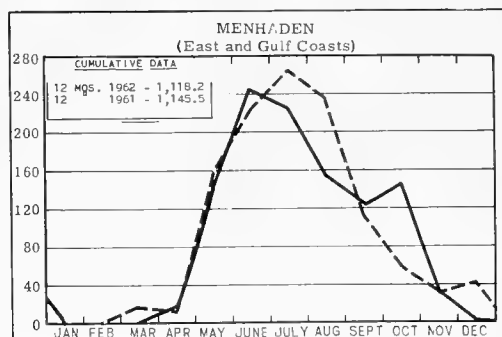


In Millions of Pounds

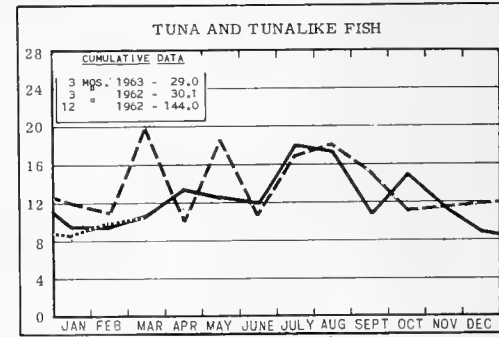
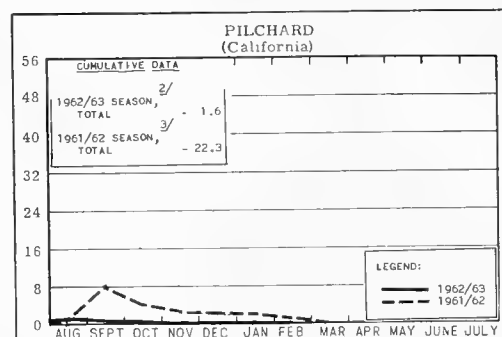


^{1/}L.A. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



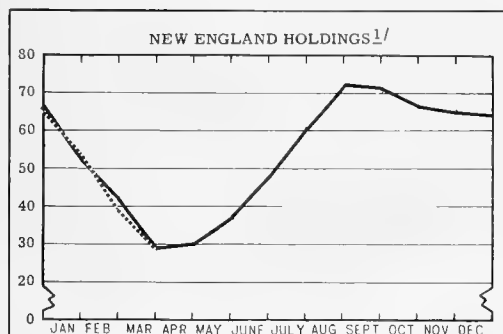
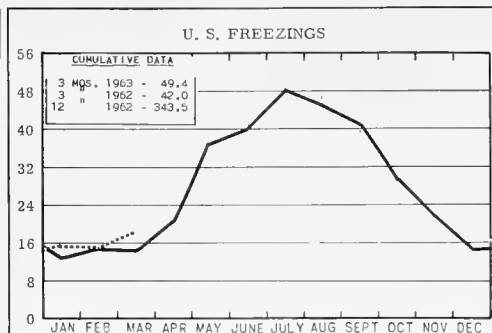
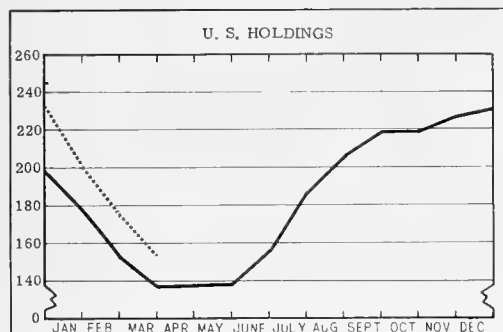
In Thousands of Tons



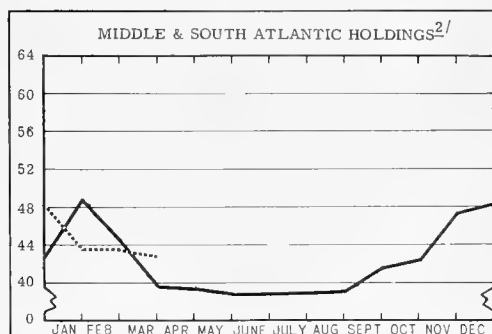
^{2/}SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963. ^{3/}SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

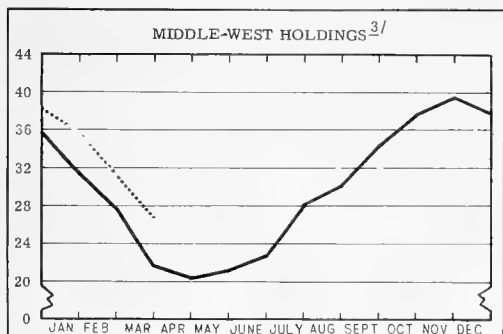
In Millions of Pounds



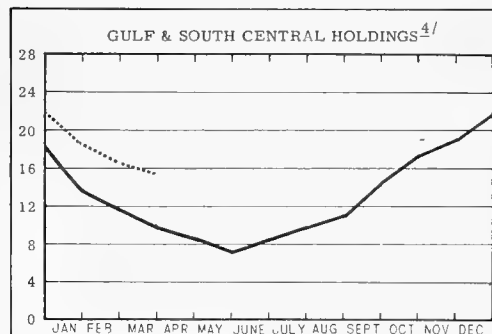
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



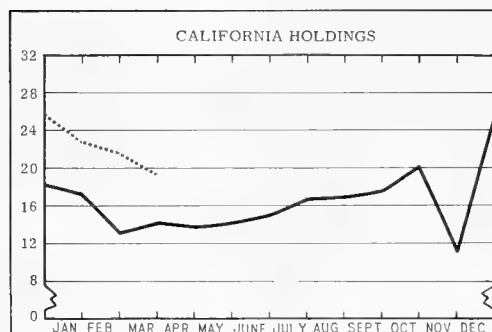
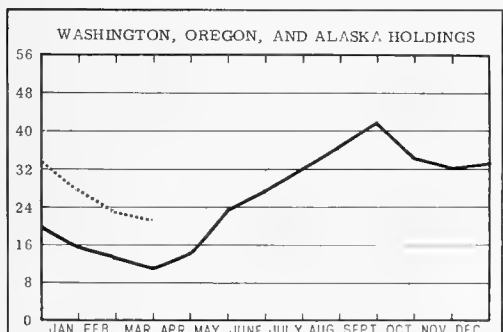
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.



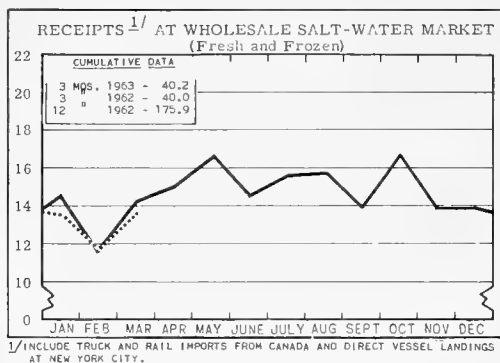
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



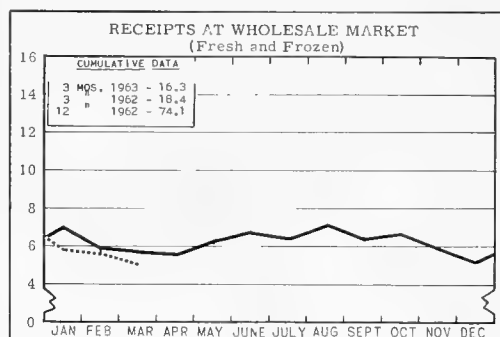
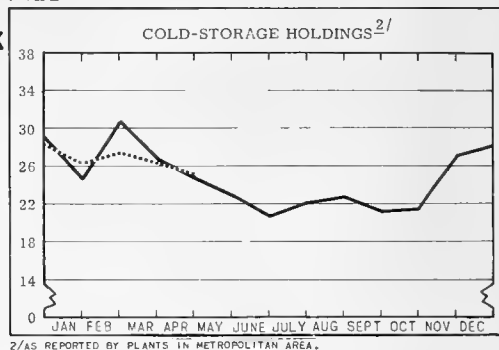
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

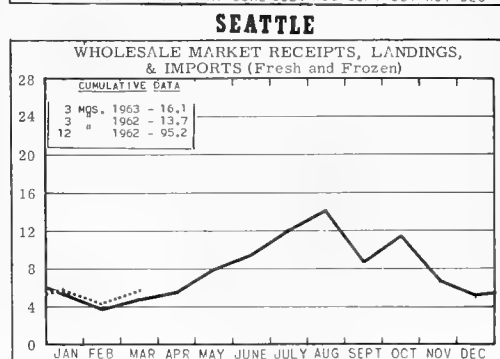
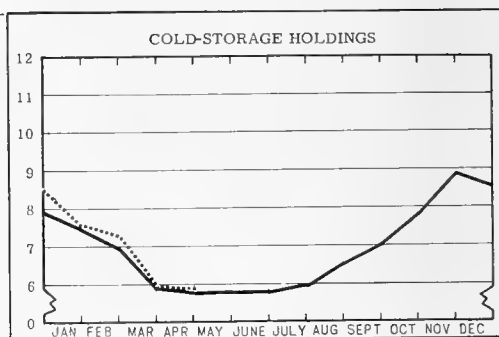
In Millions of Pounds



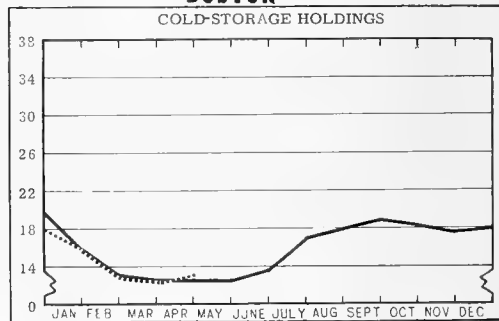
NEW YORK CITY



CHICAGO



BOSTON



LEGEND:
..... 1963
———— 1962

CHART 5 - FISH MEAL and OIL PRODUCTION

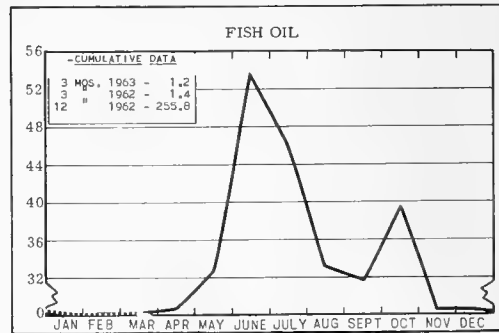
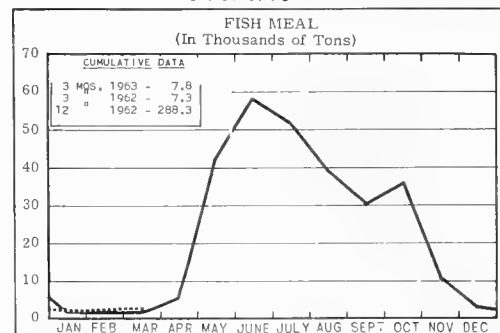
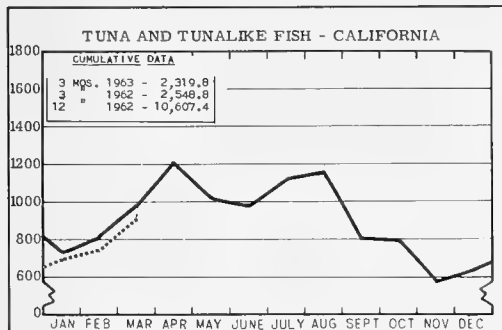
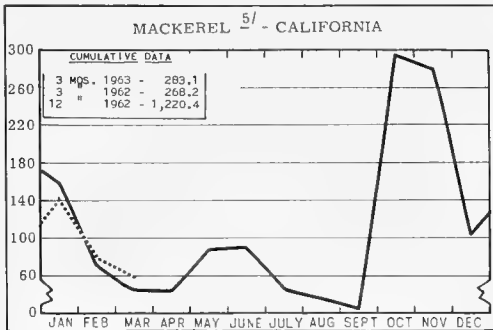


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

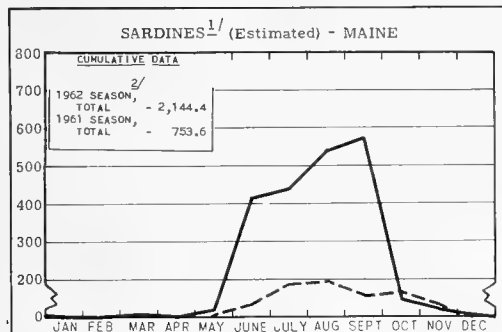
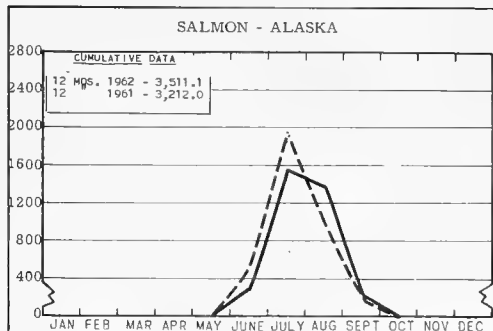
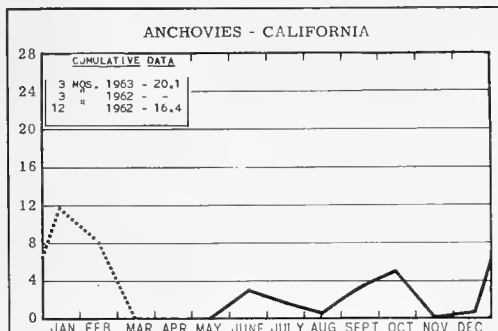
In Thousands of Standard Cases



LEGEND:
..... 1963
—— 1962
--- 1961



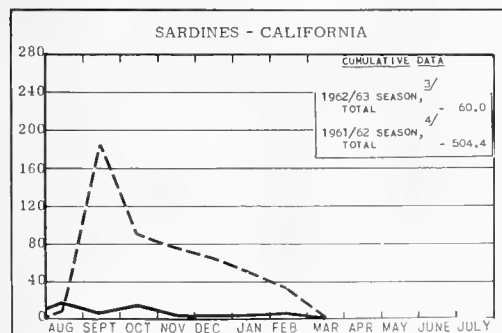
^{5/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



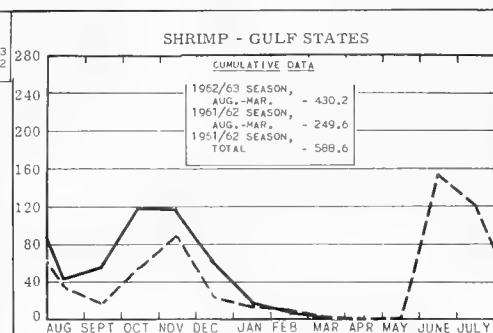
^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	3 $\frac{3}{4}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



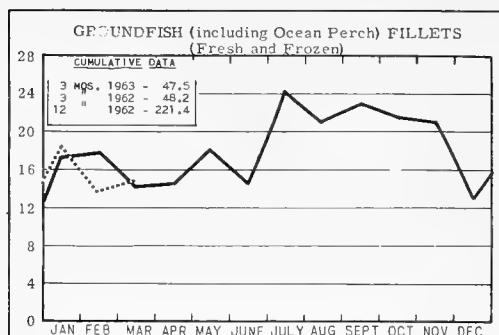
LEGEND:
—— 1962/63
--- 1961/62



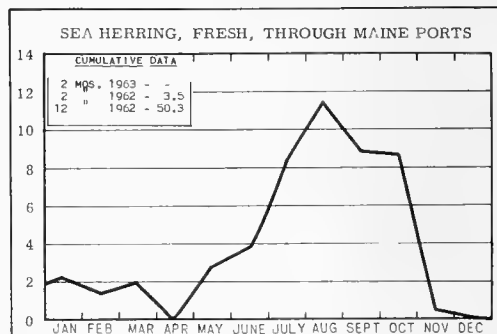
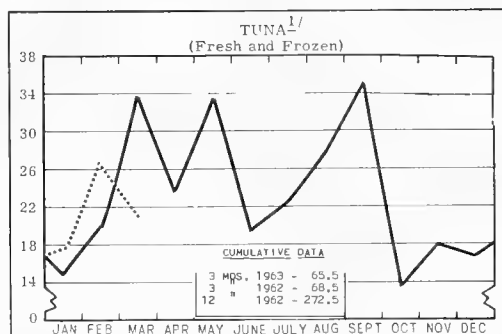
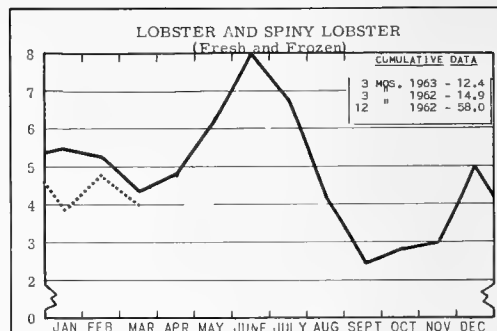
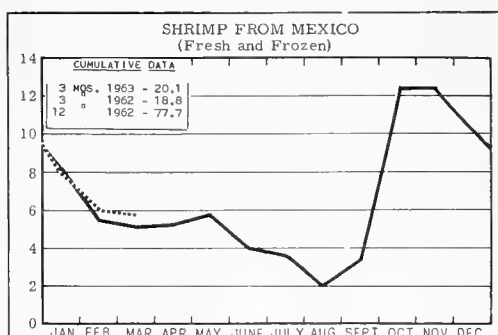
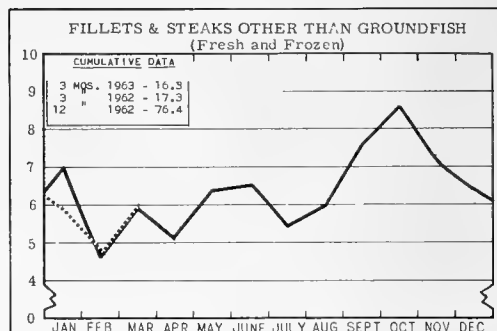
^{3/} SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963.
^{4/} SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

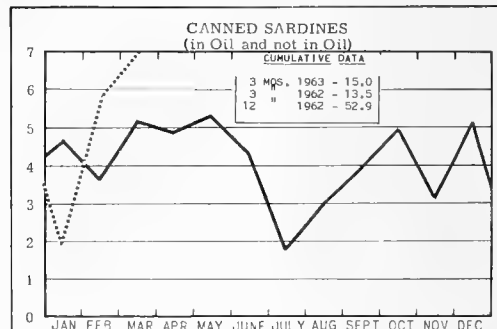
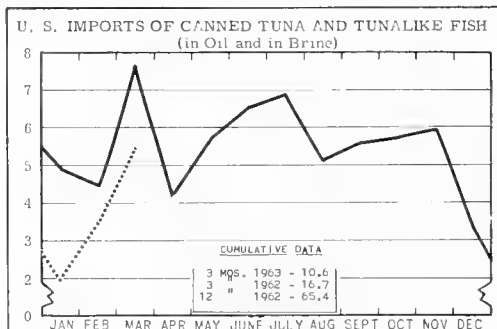
In Millions of Pounds



LEGEND:
..... 1963
———— 1962



^{1/} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3094	- Massachusetts Landings, August 1962, 5 pp.
CFS-3099	- Alabama Landings, November 1962, 3 pp.
CFS-3100	- Frozen Fishery Products, January 1963, 8 pp.
CFS-3105	- New Jersey Landings, December 1962, 4 pp.
CFS-3106	- New York Landings, December 1962, 4 pp.
CFS-3107	- California Landings, November 1962, 4 pp.
CFS-3111	- Michigan Landings, November 1962, 3 pp.
CFS-3112	- Ohio Landings, December 1962, 2 pp.
CFS-3113	- Wisconsin Landings, December 1962, 2 pp.
CFS-3115	- North Carolina Landings, December 1962, 4 pp.
CFS-3117	- Alabama Landings, December 1962, 3 pp.
CFS-3118	- Massachusetts Landings, September 1962, 5 pp.
CFS-3119	- Mississippi Landings, December 1962, 3 pp.
CFS-3120	- Rhode Island Landings, December 1962, 3 pp.
CFS-3121	- Massachusetts Landings, October 1962, 6 pp.
CFS-3122	- Pacific Coast Fisheries, 1961 Annual Summary, 10 pp.
CFS-3123	- Texas Landings, November 1962, 3 pp.
CFS-3124	- Fish Sticks and Fish Portions, Annual Summary, 3 pp.
CFS-3125	- Texas Landings, December 1962, 3 pp.
CFS-3126	- Maine Landings, December 1962, 4 pp.
CFS-3127	- Maryland Landings, January 1963, 3 pp.
CFS-3128	- Hawaii Fisheries, 1961 Annual Summary, 4 pp.
CFS-3129	- Florida Landings, January 1963, 8 pp.
CFS-3131	- Georgia Landings, January 1963, 2 pp.
CFS-3133	- Michigan Landings, December 1962, 3 pp.
CFS-3135	- South Carolina Landings, January 1963, 2 pp.
CFS-3146	- Maine Landings, January 1963, 4 pp.

FL-456 - White-Spot Disease of Fish Eggs and Fry, by Ken Wolf, 3 pp., August 1962 (Revised).

FL-541 - Aquatic Biology and Oceanography, A Selected List of Books, by Paul T. Macy and Ida K. Johnson, 10 pp., January 1963.

FL-543 - List of Special Scientific Reports and Special Scientific Report--Fisheries of the U.S. Fish and Wildlife Service, by Lola T. Dees, 38 pp., August 1962.

FL-544 - Report on the 1961 Transportation Research and Service Activities of the Bureau of Commercial Fisheries, by Carl P. Hoffman Jr. and Donald S. Fitz-Gibbon, 7 pp., June 1962.

FL-545 - List of Fishery Cooperatives in the United States, by Leslie D. McMullin, 19 pp., August 1962 (Revised).

FL-546 - Glossary of Terms used in Fur Seal Research and Management, 10 pp., February 1963.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON 25, D. C.

Number	Title
MNL-22	- Fisheries: Republic of South Africa and Territory of South West Africa, 1961, 27 pp.
Sep. No. 672	- Storage Life of Individually Frozen Pacific Oyster Meats, Glazed with Plain Water or with Solutions of Ascorbic Acid or Corn Syrup Solids.
Sep. No. 673	- Fluctuations in Maine Shrimp Landings.
Sep. No. 674	- Review of the 1962 Seasonal Movement of Albacore Tuna off the Pacific Coast of the United States.
SL-28	- Wholesale Dealers in Fishery Products, Michigan (Great Lakes Area), 1962, 3 pp. (Revised).
SSR-Fish. No. 407	- Waterflow through a Salmon Spawning Riffle in Southeastern Alaska, after Fertilization, by William L. Sheridan, 25 pp., illus., March 1962.
SSR-Fish. No. 421	- Annual Fish Passage Report Rock Island Dam Columbia River, Washington, 1961, by Paul D. Zimmer and John H. Broughton, 26 pp., illus., April 1962.
SSR-Fish. No. 423	- The Composition, Abundance, and Depth Distribution of the 1957 Summer Net Zooplankton of Bare Lake, Alaska, after Fertilization, by Robert F. Raleigh, 17 pp., illus., 1963.
SSR-Fish. No. 428	- An Evaluation of Fyke Trapping as a Means of Indexing Salmon Escapements in Turbid Streams, by Howard D. Tait, Jerry L. Hout, and Fredrik V. Thorsteinson, 21 pp., illus., June 1962.

SSR-Fish. No. 433 - The Preparation of Marine Phytoplankton for Microscopic Examination and Enumeration on Molecular Filters, by Robert W. Holmes, 9 pp., June 1962.

SSR-Fish. No. 437 - Fall Chinook Salmon Returns to Hatcheries in the Bonneville Dam Pool Area, 1945-60, by Eugene M. Maltzoff and Paul D. Zimmer, 16 pp., illus., 1963.

SSR-Fish. No. 441 - The Bathymograph, A Depth-Time Recorder, Frank J. Hester, Donald C. Aasted, and Robert W. Gilkey, 8 pp., illus., 1963.

Operations of the Bureau of Commercial Fisheries under the Saltonstall-Kennedy Act, Fiscal Year 1961, 100 pp., illus., processed. The seventh annual report to the Congress of the activities of the U.S. Bureau of Commercial Fisheries during the fiscal year ending June 30, 1961, under the provisions of the Saltonstall-Kennedy Act of July 1, 1954. This publication discusses commercial fishery progress by geographic areas including nationwide programs such as technological projects, economic studies, statistical programs, Market News services, and marketing programs. Among the important accomplishments during fiscal year 1961: (1) the Bond Award of the American Oil Chemists' Society was given a Bureau scientist and a contractor scientist for their outstanding co-authored publications on the development of thin-layer chromatography as adapted to fish oil research; (2) two Bureau films, "Salmon-Catch to Can," and "Sponge--Treasure from the Sea," received awards from the Edinburgh International Film Festival and the American Film Festival, respectively; (3) in New England, growth rates for sea scallops were established--they were found to enter the commercial fishery at 4 years of age; (4) it was concluded that storage of groundfish in refrigerated sea water offers promise in extending keeping quality and in reducing handling costs; (5) observations in the research program in Delaware Bay on oyster mortalities indicated a decrease in mortality among survivors of recent years, and their offspring, due possibly to resistance to MSX; (6) results of a 3-year study on striped bass in the Potomac River showed the population size ranged between 2 and 3 million pounds annually and the commercial fishery harvested about 40 percent of available fish; (7) collections of young menhaden in the Gulf of Mexico confirmed the theory that all major estuaries on both the Atlantic and Gulf coasts are nurseries for menhaden; (8) results of radiation studies on marine organisms showed that when fertilized fish eggs are irradiated at low levels, the number of developmental abnormalities increased; (9) in the Gulf of Mexico, observations proved that populations of the 3 major shrimp species produce 2 definable broods each year; (10) in the Great Lakes area, preliminary studies conducted on breaded chub fillets created interest in the commercial possibilities of this product; (11) the presence of 2 genetically distinct stocks of Pacific sardines within the area of the fishery was substantiated on the basis of blood type frequencies; (12) in the North Pacific Ocean, more than 11,000 salmon were tagged, of which nearly half were red salmon. Results of the study indicated that Bristol Bay red salmon are distributed throughout the Aleutian Island area; (13) it was found that the survival of eggs from pink salmon spawning in intertidal areas in Alaska may be very significant in determining the survival for each brood year; and (14) in Hawaii, results of a study on the use of gill nets for catching

skipjack tuna showed a striking difference in the catches made with multifiber sections and with monofilament sections. Of a total of 324 shipjack caught, 319 were taken on the monofilament section and only 5 on the dyed multifiber sections.

Report of the Bureau of Commercial Fisheries for the Calendar Year 1958, 68 pp., printed, 1962. An account of the activities of the Bureau of Commercial Fisheries during 1958 together with a record of its administrative actions. The Bureau activities are aimed towards encouraging a strong, prosperous, and thriving commercial fishery industry based on well-utilized resources. To accomplish the objectives, programs of research, development, and services were carried out with increasing intensity during 1958. The report discusses the condition and trends of the fisheries, developments in the domestic fisheries, Federal legislation, and international developments. Principal accomplishments of the Bureau and new programs are also covered.

Report of the Bureau of Commercial Fisheries for the Calendar Year 1959, 81 pp., printed, 1962. The Bureau of Commercial Fisheries is responsible for carrying out the national fishery policy as outlined in the Fish and Wildlife Act of 1956: (1) to increase and maintain, for the people of the United States, a fishery resource capable of yielding the maximum annual product; (2) to strengthen and maintain a vigorous fishery industry by assuring full and fair access to its raw materials and to the American market; and (3) to do these things in partnership with the States and in full accordance with international obligations. Programs have been developed to effect this policy. Most of them involve biological, economic, and technological research. Others supply important services to the industry; such as promoting the consumption of fish, collection and publication of fishery statistics and market news, inspection of fishery products, vessel safety promotion, and many others. The report discusses the condition and trends of the fisheries, developments in the domestic fisheries, Federal legislation, and international developments. Principal accomplishments of the Bureau and new programs are also covered.

Report of the Bureau of Commercial Fisheries for the Calendar Year 1960, 75 pp., printed, 1962. During the calendar year 1960, the Bureau of Commercial Fisheries continued its efforts to provide the research and services that will assist the Nation to utilize fully and wisely its fishery resources. These efforts cover a wide spectrum of activities, from basic research in fields such as fishery biology or fish oil technology to such practical applications as school demonstrations of fish cookery or the dissemination of daily news of prices for fish landed in principal United States ports. The report touches briefly on phases of biological, economic, engineering, oceanographic, and technological research. It also discusses the many Bureau service programs, such as those involved in fishery products inspection, fishery market promotion, market news reporting, statistics collection, vessel loans, vessel safety promotion, and others.

The Sea, Conservation Note 10, 8 pp., illus., processed, December 1962. An educational leaflet covering oceanography, types of fish of commercial value, plant and animal resources of the sea, and the possibility of developing economical ways of converting salt water to fresh water.

Ten Years of Sport Fish Restoration--The Dingell-Johnson Program, 28 pp., illus., printed.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, BOX 3630, HONOLULU, HAWAII.

On the Comparative Efficiency of Production of Some Products of the Land and Sea, by S. V. Mikhailov, 12 pp., processed, October 1962. (Translated from the Russian, *Okeanologiya*, vol. 2, no. 3, 1962, pp. 385-392.)

On the Surface Zooplankton of the Indian Ocean, by N. M. Voronina, 20 pp., illus., processed, December 1962. (Translated from the Russian, *Biological Investigations of the Sea-Plankton, Academy of Sciences of the USSR, Works of the Institute of Oceanology*, vol. LVIII.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE ICHTHYOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, FISH AND WILDLIFE SERVICE, U. S. NATIONAL MUSEUM, WASHINGTON 25, D. C.

On the Numbers of Vertebrae and on a Few Other Osteological Characters of the Antarctic Fishes (by X-Ray), by Anatoly P. Andriashev, 7 pp., processed. (Translated from the Russian, *Voprosy Ichthyologii*, vol. 12, 1959.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, January 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, February 1963, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., Room 208, San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II--Fishing Information, February 1963, 11 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, February 1963, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Room 1014, Chicago 7, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-wa-

ter fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Farm Reservoir Fishes, FWS Circular 131, 12 pp., illus., printed, 1962. (U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, Fish Farming Experimental Station, Stuttgart, Ark.) Production of fish in rotation with rice and other field crops is an expanding industry. Sport, food, and bait fishes are in production in the South Central United States. Some reservoirs are stocked with sport fish and angling is permitted on a fee basis. A variety of species is usually stocked into a reservoir to provide the best use of the food resources available. Other less desirable species occasionally find their way in and compete with the stocked fish for food and space. This brochure will help identify the fishes taken from a reservoir. The information given about each species should help in selection of the fish most suited for stocking in a particular reservoir. A few notes on water areas management are included.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, February 1963, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, Room 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

New England Fisheries--Monthly Summary, February 1963, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by type of gear; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--December 1962 and January 1963, 19 and 14 pp. respectively. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, February 1963, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4,

Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

"Development and Distribution of Larval and Juvenile Fishes of the Family Mullidae of the Western North Atlantic," by Melba C. Caldwell, *Fishery Bulletin* 213 (from *Fishery Bulletin of the Fish and Wildlife Service*, vol. 62, pp. 403-457), 59 pp., illus., printed, 40 cents, 1962.

"Distribution of Tunas in Oceanic Waters of the Northwestern Atlantic," by James L. Squire, Jr., *Fishery Bulletin* 211 (from *Fishery Bulletin of the Fish and Wildlife Service*, vol. 62, pp. 323-341), 23 pp., illus., printed, 20 cents, 1962.

"Gulf of Mexico Commercial Shrimp Populations--Trends and Characteristics, 1956-59," by Joseph H. Kutkuhn, *Fishery Bulletin* 212, (from *Fishery Bulletin of the Fish and Wildlife Service*, vol. 62, pp. 343-402), 64 pp., illus., printed, 40 cents, 1962.

"Introduction of the Threadfin Shad to Hawaii," by Thomas S. Hida and Donald A. Thomson, article, *Progressive Fish Culturist*, vol. 24, no. 4, 1962, pp. 159-163, processed, 25 cents.

"Three Portable Feeders for Metering Chemical into Streams for Control of Sea Lamprey," by Gaylord A. Anderson, article, *Progressive Fish Culturist*, vol. 24, no. 4, 1962, pp. 190-192, processed, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

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"Abalones in British Columbia," by D. B. Quayle, article, *Western Fisheries*, vol. 64, July 1962, pp. 28-31, printed, Roy Wrigley Publications Ltd., 1104 Hornby St., Vancouver 1, B.C., Canada.

California Abalones, Family Haliotidae, by Keith W. Cox, *Fish Bulletin* No. 118, 132 pp., illus., printed, \$1.15. Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif., 1962. Covers a 10-year study of abalones, describing the genus *Haliotis* and its geographical distribution. A section on the California abalones de-

scribes the anatomy of the *Haliotis*, its life history, enemies, parasites, and other problems. Also gives a history of the Indian, Mexican, and California abalone fisheries.

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Economic Marine Algae of Ceylon, IPFC Occasional Paper 61/4, printed, Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1961.

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Research on the Marine Flora of the Pacific Area (Final Report January 1, 1960-August 31, 1962), by E. Yale Dawson, AD-287 736 Div. 16 (TISTB/SAT), 3 pp., printed, \$1.10. Beaudette Foundation for Biological Research, Solvang, Calif., 1962. (For sale by Office of Technical Services, Washington 25, D. C.)

"Some Interesting Algae from Lake Huron," by Mason G. Fenwick, Contribution No. 4, 5 pp., illus., printed. (Reprinted from *Transactions of the American Microscopical Society*, vol. LXXXI, no. 1, January 1962, pp. 72-76.) The Great Lakes Research Division, Institute of Science and Technology, The University of Michigan, Ann Arbor, Mich.

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Largemouth Bass, 7 pp., illus., printed, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Describes the appearance, habits, adaptability, and commercial value of the largemouth bass in Louisiana.

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"The Influence of Temperature on the Behaviour of Fish," by I. Hela and T. Laevastu, *FAO Fisheries Biology Technical Paper* No. 22, 23 pp., illus., processed, distribution restricted. (Reprinted from *Archivum Societatis Zoologicae Botanicarum Fennicae "Vanamo"*, vol. 15, nos. 1-2, 1961, pp. 83-103.) Fisheries Division, Biology Branch, Food and Agriculture Organization of the United Nations, Rome, Italy, September 1962.

"O Povedenii Ryby Pered Tralom Pro Vozdeistvii Na Nee Elektricheskogo Polya Peremennogo Toka i Medhanicheskogo Razdrzhitelya (The Effect of an AC Electrical Field and a Mechanical Irritant on the Behavior of Fish in Front of a Trawl)," by V. A. Shentyakov, article, *Biological Abstracts*, vol. 39, no. 2, 1962, Abstract No. 4674, printed in Russian.

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University of Pennsylvania 3815 Walnut St., Philadelphia 4, Pa.

BENELUX COUNTRIES:

Import Tariff System of Belgium, Netherlands, and Luxembourg, OBR-63-25, 4 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., February 1963. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Presents information on customs tariff; units of currency, weight, and measures; bases of specific and ad valorem duties; sales and other internal taxes; consular documents and fees; import restrictions; and related subjects.

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mon Market; progress in pesticide research; foreign fishing activities off the Atlantic Coast; shellfish cleansing; striped bass studies in New Jersey; technological problems of the blue-crab industry; and the radiation-preservation program at the Gloucester Technological Laboratory.

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Light Fishing, by Raimondo Sara, GFCM Studies and Reviews No. 19, 45 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, August 1962. This study attempts to assemble all the information available about the reactions of fish to light, and to study technical fisheries problems. It reports on findings concerning intensity of lights used in fishing, the effects of colored lights, and underwater lamps and electric generators. The appendix contains tables giving information on characteristics of sources of light and characteristics of boats and gear used in fishing with lights in the Mediterranean. Also includes several excellent photos and drawings.

"O Prichinakh Privlecheniya Ryb Na Svet (Why Light Attracts Fish)," by V. N. Belyaeva and I. V. Nikonov, article, Voprosy Ikhtiologii, vol. 1, no. 3, pp. 513-518, printed. Akademia Nauk, U.S.S.R., Ikhtologicheskaya Komissiya, Moscow, U.S.S.R.

FISH MEAL:

"Chemical Composition of Fish Meals. II," by Eliezer de Carvalho Rios (Ministry of Agriculture, Rio Grande, Brazil), article, Chemical Abstracts, vol. 56, June 11, 1962, 14675i, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

Fish Meal Supply and Price Trends, by Jack S. Ross, ERS-112, 12 pp., illus., processed. (Reprinted from Feed Situation, FdS-197, February 1963, pp. 27-37.) Economic Research Service, U. S. Department of Agriculture, Washington 25, D. C. Reports on supply, demand, prices, and trends in fish meal during recent years. According to the author "Domestic demand for fish meal has expanded rapidly in recent years. In the 1961-1962 feeding year, the total tonnage fed reached a record high of 615,000 tons, 50 percent more than 5 years ago. Even at this level, fish meal makes up only about 1.5 percent of the

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total tonnage of commercially prepared livestock and poultry feeds and about 4 percent of total high-protein feeds. However, its importance as an ingredient of poultry and hog rations is much greater than indicated by its relatively small volume. Fish meal is a primary source of certain amino acids (mainly lysine and methionine) and B-complex vitamins. These are not found in sufficient quantities in feed grains and many of the other byproducts." This report includes charts and tables giving data on fish meal supplies; production, imports, and supplies; production from menhaden; and other similar information. Most data are for 1952-1962, with some for earlier years.

Nutrient Composition of British Columbia Whole Herring Meal, by B. E. March, Jacob Biely, and H. L. A. Tarr, Circular No. 26, 11 pp., processed. Fisheries Research Board of Canada, Technological Station, Vancouver, B. C., Canada, September 1962.

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"Denaturation of the Actomyosin-Fraction in Fish Muscle Under the Influence of Salt Solutions," by R. R. Linko, article, *Kylteknisk Tidskrift*, vol. 21, no. 3, 1962, pp. 50-51, illus., printed in Swedish. Svenska Kyltekniska Forening, 86 St. Eriksgaten, Stockholm V, Sweden.

"Studies on the Physiological Chemistry of Phosphorus Compounds in Fish Muscle. VI--The Effects of Ammonium Chloride and Sodium Chloride in Water on Phosphorus Compounds in Fish Muscle," and "VIII--The Effect of Urethan on Phosphorus Compounds in Muscle of Mackerel," by Tomoo Nakano, articles, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, September 1961, pp. 850-854, and vol. 27, December 1961, pp. 1095-1099, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FISH OIL:

"On the Yellowtail Oil. IV--Acetone-Soluble Lipid and Lecithin in Pyloric Appendages," by Hideo Tsuyuki and Uhei Naruse, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, August 1961, pp. 734-737, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

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Methods of Treating the Bottom of Fish Ponds and Their Effects on Productivity, by Alfred G. Wurtz, *GFCM Studies and Reviews* No. 11, 51 pp., printed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1960.

FISH SCHOOLS:

"Otrazhatel'naya Sposobnost' Pelagicheskikh IDonnykh Ryb (Sound-Reflecting Capacity of Pelagic and Benthic Fish)," by E. V. Shishkova, article, *Rybnoe Khoziaistvo*, vol. 10, 1960, pp. 56-63, printed. VNIRO Glavnioproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISH STOCKS:

Recent Model Concepts on the Dynamics of Demersal Fish Stocks, by Gotthilf Hempel and Dietrich Sahrhage, 45 pp., processed. (Translated from the German, *Berichte Deutsche Wissenschaftliche Kommission*

fur Meeresforschung, vol. XVI, no. 2, pp. 51-89.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England, 1961.

FISH TRANSPORTATION:

"Perevozka Ryby V Germeticheskoy Chane SKislородom (The Transportation of Fish in a Hermetically Sealed Container with Oxygen)," by R. Gumerov, article, *Rybovodstvo I Rybolovstvo*, vol. 4, 1961, pp. 16-17, printed. Rybovodstvo I Rybolovstvo, Ministerstvo Sel'skogo Khoziaistva SSSR, Moskva, U.S.S.R.

"The Transport and Handling of Fish," Hygiene Codes of Practice No. 4, 15 pp., illus., printed. H. M. Stationery Office, York House, Kingsway, London WC2, England, 1960.

FLATWORMS:

Survival and Movements of the Flatworm, STYLOCHUS ELLIPTICUS, in Different Salinities and Temperatures, by Warren S. Landers and Richard C. Toner (U. S. Bureau of Commercial Fisheries, Biological Laboratory, Milford, Conn.), 8 pp., illus., printed. (Reprinted from *Biological Bulletin*, vol. 123, no. 1, August 1962, pp. 146-153.) The Marine Biological Laboratory, Woods Hole, Mass.

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Bathymetry of the Straits of Florida and the Bahama Islands, by Robert J. Hurley, Violet B. Siegler, and L. Kenneth Fink, Jr., Contribution No. 414, 9 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 12, no. 3, September 1962, pp. 313-321.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

Effect of Hurricane Donna on the Aquatic Fauna of North Florida Bay, by Durbin C. Tabb and Albert C. Jones, Contribution No. 402, 4 pp., illus., printed. (Reprinted from *Transactions of the American Fisheries Society*, vol. 91, no. 4, October 1962, pp. 375-378.) Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

Hydrographic Data, Supplement I, from the Inshore Bays and Estuaries of Everglades National Park, Florida 1959-1962, by Durbin C. Tabb and David L. Dubrow, 62-69, 22 pp., illus., printed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., 1962.

Results of the Tagging of Salt Water Fishes in Florida, by Robert M. Ingle, Robert F. Hutton, and Robert W. Topp, Technical Series No. 38, 63 pp., illus., printed. The State Board of Conservation, Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla., September 1962.

Seasonality of Fishes on a South Florida Shore, by Victor G. Springer and Andrew J. McErlean, Contribution 59, 22 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 12, no. 1, March 1962, pp. 39-60.) Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., 1962.

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"Ecology of an Estuarine Population of Winter Flounder *Pseudopleuronectes americanus* (Walbaum). I--Hy-

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drography of the Mystic River; II--Distribution and Dynamics of Larvae; III--Distribution, Abundance, Growth, and Production of Juveniles; IV--Food Habits of Larvae and Juveniles," by William G. Percy, articles, vol. 18, article 1, 1962, pp. 5-78, printed, Peabody Museum of Natural History, Yale University, New Haven, Conn.

FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries (Vols. 1 to 4 and 1957 Supplement, Subject Index--Physical Oceanography), 37 pp., processed, distribution restricted. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, November 1962. Contains detailed indexes to entries relating to the subject of physical oceanography.

English Translation of Convention Between the Governments of the U.S.S.R. and Japan on Deep Sea Fisheries in the Northwest Pacific (1956), FB/T27, 12 pp., processed, distribution limited. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, October 1962.

FOOD HABITS:

"The Types of Food Habits of Fishes (Determined) by Stomach Contents Examination," by F. Yasuda, article, Bulletin of Japanese Society of Scientific Fisheries, vol. 26, no. 7, 1960, pp. 653-662, printed in Japanese. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FOOD MANAGEMENT:

Using Storage in Food Service Establishments, by Robert F. Lukowski, Charles E. Eshbach, and Albert L. Wrisley, Jr., Food Management Program Leaflet No. 4, 24 pp., illus., printed, Cooperative Extension Service, University of Massachusetts, 408 Atlantic Ave., Room 302, Boston 10, Mass., 1962. This publication considers some aspects of the efficient use of storage facilities in a food service establishment. It is designed to call attention to major problem areas in the use of storage, and to suggest ways in which difficulties may be avoided or minimized. It discusses the storage care of various types of foods, including fresh and frozen fish.

FRANCE:

"Les Peches Lointaines, Objectif de Demain" (The Distant-Water Fisheries--Goal for the Future), by R. Lenier, article, France Pêche, no. 70, February 1963, pp. 15-17, illus., printed in French. France Pêche, Boite Postale 179, Lorient, France.

FREEZE-DRYING:

"Engineering Aspects of Freeze-Drying Foods," by J. D. Mellor, articles, Refrigeration Journal, vol. 15, no. 10, April 1962, pp. 38-41; vol. 15, no. 11, May 1962, pp. 38-39, 42-43, illus., printed, John D. Jukes, Pty., Ltd., 165 Clarence St., Sydney, Australia. A brief review of progress in freeze-drying from 1909 to date is given, followed by an explanation of the principles involved. Part 2 of the article deals with the type of equipment being used in the process.

FREEZING:

"The Effect of Freezing in Fish Muscle," by R. M. Love, article, Recent Advances in Food Science, pp.

147-150, printed. University of Glasgow, Glasgow, Scotland, 1962.

"Freezing Fish at Sea Aboard Canadian Fishing Boats," by O. C. Young, article, Canadian Fisherman, vol. 48, December 1961, pp. 29-30, printed. National Business Publications Ltd., Gardenvale, Quebec, Canada.

"Modern Meat Freezing Plants on Board of Whalers," by E. Hofmann, article, Kaltetechnik, vol. 13, no. 3, March 1961, pp. 128-133, illus., printed in German. C. F. Muller Verlag, Karlsruhe, Germany.

FROGS:

Frogs and Toads of Louisiana, by Perch Viosca, Jr., 7 pp., illus., printed, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Discusses briefly the twenty-five different kinds of toads and frogs found in Louisiana.

GATT:

General Agreement on Tariffs and Trade--Schedules of the United States of America, Department of State Publication 7451, 144 pp., processed, 70 cents. Department of State, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Contains schedules of the United States of America annotated to show countries with which concessions were negotiated at Geneva in 1960-1961.

GRAY SNAPPER:

Growth and Food of the Gray Snapper, LUTJANUS GRISEUS in Everglades National Park, by Robert A. Croker, Contribution No. 403, 5 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 91, no. 4, October 1962, pp. 379-383.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

GREENLAND:

East Greenland Fishing, Laboratory Leaflet No. 25, 3 pp., illus., processed. U. K. Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, England, 1960.

GUATEMALA:

Basic Data on the Economy of Guatemala, OBR-62-35, 24 pp., illus., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses, among other items related to the economy of Guatemala, the fishing industry which is underdeveloped although there are opportunities for profitable development of both offshore and freshwater fisheries.

Import Tariff System of Guatemala, OBR-62-37, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on units of currency, weights, and measures; bases of specific and ad valorem duties; method of payment of duty; preferential and differential duties; consular fees and documents; trade restrictions; and other special regulations.

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HADDOCK:

"Development of Volatile Carbonyls in Haddock (*Melanogrammus aeglefinus*) Flesh During Storage at 20°C.," by Joseph M. Mendelsohn and Maynard A. Steinberg, article, *Food Technology*, vol. 16, June 1962, pp. 113-115, printed. The Garrard Press, 510 North Hickory, Champaign, Ill.

HERBICIDES:

"The Toxic Effect of Pentachlorophenolate, a Herbicide, on Fishery Organisms in Coastal Waters. I--The Effect on Certain Fishes and a Shrimp," by Tetuo Tomiyama and Katsumi Kawabe, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, no. 3, 1962, pp. 379-382, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

HERMIT CRABS:

The Larval Development of the Tropical Land Hermit COENOBITA CLYPEATUS (Herbst) in the Laboratory, by Anthony J. Provenzano, Jr., Contribution No. 392, 21 pp., illus., printed. (Reprinted from *Crustaceana*, vol. 4, part 3, 1962, pp. 207-228.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

HERRING:

"Plane Spots Herring Spawns," by D. N. Outram, article, *Trade News*, vol. 15, no. 4, October 1962, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. An aerial survey of herring spawning grounds along the rugged west coast of the Queen Charlotte Islands was undertaken in early April 1962. The purpose of the survey was twofold: (1) to evaluate aerial reconnaissance as a method of reporting herring spawning in remote areas; and (2) to obtain some indication of the size of the west coast spawning stocks.

Studies on the Stock of Pomeranian Bay Spawning

Spring Herring in 1950-1954, by Włodzimierz Fesolowicz, OTS 60-21283, 24 pp., illus., processed, 50 cents. (Translated from the Polish, *Prace Morskiego Instytutu Rybackiego w Gdyni*, no. 9, 1957, pp. 151-173.) Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C., 1962.

INDIA:

India: A Growing Market for U. S. Products and Investment, OBR-63-26, 28 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., January 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report presenting information on India as a growing market for U. S. products and investment. It discusses India's foreign trade during 1951-1961, reflecting the economic growth under the five-year plans; and trade with the United States. Also covers import policy and foreign aid as factors in trade; the third five-year plan, 1961-1966; and outlook for foreign investment.

Investment Factors in India, OBR-62-40, 28 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent

of Documents, U. S. Government Printing Office, Washington 25, D. C.) A question and answer type of report on investment factors in India. Presents information on the scope and growth rate of private foreign investment and licensing in India; fields for investment; operating facilities in India; and related subjects.

INDONESIA:

Licensing and Exchange Controls of Indonesia, OBR-62-34, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the import and export controls of Indonesia, and United States import and export controls.

INTERNATIONAL COMMISSIONS:

(International North Pacific Fisheries Commission) Chairman of Canadian Section Outlines Reasons for Decisions and Recommendations of Commissioners, by G. R. Clark, article, *Trade News*, vol. 15, no. 7, January 1963, pp. 7-10, processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

(International North Pacific Fisheries Commission) Proceedings of the Ninth Annual Meeting, 1962, 204 pp., illus., processed. International North Pacific Fisheries Commission, 6640 NW., Marine Dr., Vancouver 8, B. C., Canada.

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"World Trade in Fish," by Georg Borgstrom, article, *Fishing News International*, vol. 2, no. 1, January-March 1963, pp. 17-21, illus., printed, single copy 6s., 6d (about 91 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

IRAN:

Investment Factors in Iran, by George S. Ayers, OBR-63-15, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., January 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on prospects for U. S. private investment in Iran. Government controls over industry, screening of investment proposals, taxation, and financial facilities.

IRELAND:

Import Tariff System of Ireland, OBR-62-38, 2 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on units of currency, weights, and measures; bases of specific and ad valorem duties; method of payment of duty, preferential duties; trade restrictions; and other special regulations.

Report to the Government of Ireland on the Development of the Sea Fishery Industries, by I. S. McArthur, 82 pp., illus., processed. Fisheries Division, Food and Agriculture Organization of the

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United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1959.

IRISH MOSS:

"The Irish Moss Industry in the Maritimes," by M. C. Cormier, article, *Trade News*, vol. 15, no. 7, January 1963, pp. 3-6, illus., processed. Information and Consumer Research, Department of Fisheries, Ottawa, Canada. Irish moss (*Chondrus crispus*) is a small perennial seaweed growing attached to rocks near low water or beyond it, to depths of 20 feet or more. Its habitat in Europe includes Norway, the British Isles, France, and Spain. In the northwestern Atlantic, it occurs from New Jersey to Newfoundland. It is harvested with rakes, dried, and the extract (gelose of carrageen), because of its viscosity and suspension power, is used in the dairy, packing, brewing, and textile industries.

IRRADIATION:

To Determine the Effect of Irradiation upon the Wholeness of Food, by Om P. Malhotra and others, Progress Report No. 13, 17 pp., printed, Illinois University, College of Veterinary Medicine, Urbana, Ill., March 1962.

Long-Term Rabbit and Hamster Feeding of Irradiated and Control Foods and Its Effect upon the Blood Serum Constituents (Phase I) and Nutritive Value of Irradiated Proteins and Control Proteins (Phase 2), by D. F. Watson, R. M. Smibert, and R. W. Engel, Progress Report No. 10, 14 pp., printed, Virginia Agricultural Experiment Station, Blacksburg, Va., February 28, 1962.

On the Nutritive Value of the Major Nutrients of Irradiated Foods and Appraisal of the Toxicity of Irradiated Foods, by P. B. Rama Rao and others, Progress Report No. 21, 30 pp., illus., printed, University of Illinois, Urbana, Ill., March 1, 1962.

ISRAEL:

Fishermen's Bulletin, vol. 4, no. 3-4 (33-34), September-December 1962, 44 pp., illus., printed in Hebrew with English abstracts. Department of Fisheries, P.O. B. 699, Haifa, Israel. Includes, among others, the following articles: "On the Fisheries of Israel," by M. Shavit; "Fisheries Resources of the Red Sea," by A. Ben-Tuvia; "Fisheries Investigations of the Israel South Red Sea Expedition. Part II--Additional Fishes," by A. Ben-Tuvia; "Fishing in Ancient Egypt," by M. Nun; "Ancient Fishing Gear in Ein-Gev," by Z. Ben-Ami; "Plinius on Fishes," by M. Sas; "Tonara" in Eilat," by S. Levin; "Fishing with Lights during the Year 1962," by A. Ben-Tuvia; and "Summary of the 1962 Light Fishing Season," by Y. Ariav.

ITALY:

"Refrigerating Plants in the Italian Ocean Fishing Fleet," by O. Osti, article, *Il Freddo*, vol. 16, no. 2, March-April 1962, pp. 1-12, illus., printed in Italian. Associazione Frigorifera Italiana, 8 Via Donatello, Milan, Italy.

JAPAN:

Journal of the Faculty of Fisheries and Animal Husbandry, vol. 4, nos. 1-2, illus., printed. The Faculty of Fisheries and Animal Husbandry, Hiroshima Uni-

versity, Fukuyama, Japan, December 1962. Contains, among others, the following articles: "Electrical Shocking Effect on Larvae of *Balanus*;" "Comparison of Catches of Two Pound Nets Located at Different Distances from the Shore;" "Ecology of Fishes of Kasaoka Bay as Observed from the Catch of Pound Nets;" and "Reports on the Biology of the 'Umitaka-Maru' Expedition. Part 2--Planktonic Gastropoda Collected by the Training Vessel 'Umitaka-Maru' from the Pacific and Indian Oceans in the Course of Her Antarctic Expedition, 1956."

KENYA:

"The Relationship Between *Tilapia nigra* (Gunther) and *T. mossambica* (Peters) in the Eastern Rivers of Kenya," by P. J. P. Whitehead, article, *Proceedings of the Zoological Society of London*, vol. 138, part 4, 1962, pp. 605-637, printed. Ministry of Forest Development, Game and Fisheries, Nairobi, Kenya.

KOREA:

Korean Fisheries, 1962, 132 pp., illus., printed. Marine Resources Section, Fisheries Bureau, Ministry of Agriculture and Forestry, Seoul, Korea, October 1962. With the introduction of advanced fishery techniques during the first decades of this century, great progress was made in developing the industry in Korea. In 1937, Korea's fish catch amounted to more than 10 percent of the global total. However, the subsequent diminution of marine resources in the coastal waters and the outbreak of World II, then the Korean Conflict, dealt a crippling blow to Korea's fisheries. At present, vigorous effort is being made to rehabilitate the Korean fisheries industry and deep-sea fishing is being undertaken for the first time. The Government is promoting the fisheries within the framework of its Five-Year Plan for Economic Development. This report gives a brief description of the current situation in Korea's fisheries industry in the fields of fishing, processing of fisheries products, and fish culture. It also presents on outline of plans for future development of the industry. Also includes brief descriptions of the composition and functions of various fisheries organizations, particularly cooperatives, financing institutions, and administrative agencies; research, inspection, and educational organizations; together with a summary of foreign assistance and aid to fisheries. The appendix presents statistical data on fisheries production, vessels, important species landed, exports, processed products, and other related topics.

Preliminary List of Inshore Diatoms of the Southern Coast of Korea, IPFC Occasional Paper 61/II, printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1961.

LEBANON:

Establishing a Business in Lebanon, OBR-62-41, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., December 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the Lebanese Government's policy on investment; entry and repatriation of capital; foreign ownership of property; and

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regulations affecting employment; taxation; and related subjects.

LOUISIANA:

(Louisiana Wild Life and Fisheries Commission) Ninth Biennial Report, 1960-1961, 213 pp., illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. The report of the Louisiana Wild Life and Fisheries Commission during the calendar years ending December 31, 1960, and December 31, 1961, includes chapters on the Fish and Game Division and Division of the Oysters, Water Bottoms, and Seafood. The section on fisheries discusses fish hatcheries, pond and lake projects, work done under the Dingell-Johnson Project, and other topics. Also discusses research in shrimp production, clam shell planting to aid oyster reproduction, operation of seed-oyster reservations, a crawfish report, and marine biological reports. Also includes a chapter on work of the Water Pollution Control Division.

MALAGASY REPUBLIC:

"L'Avenir de la Peche Malgache" (The Future of the Malagasy Fishery), by Michel Angot, article, La Peche Maritime, vol. 42, no. 1018, January 1963, pp. 22-25, illus., printed in French, single copy 11F (about US\$2.23). La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

MANATEE:

Manatee and the Control of Water Hyacinth in the Near East, by T. J. Job, processed. (Reprinted from FAO in the Near East.) Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961.

MARICULTURE:

Shellfish Mariculture, by R. W. Menzel, Contribution No. 173, 4 pp., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Fourteenth Annual Session, November 1961, pp. 195-199.) Oceanographic Institute, Florida State University, Tallahassee, Fla. In summary the author pointed out that "The increasing need for food, the development of techniques for rearing of several of the commercial mollusks including oysters and the quahaug clam, the possibilities of pond culture and other techniques of controlled sea farming, the serious inroads in shellfish production caused by diseases, predators and other factors have caused an increasing interest in scientific mariculture. Laboratory rearing of the mollusks will result in a constant supply of seed. Techniques have been developed for the chemical control of predators and only await adequate application. Chemical and genetic control of diseases and the production of faster growing strains of mollusks are now being explored. Technology has advanced so that the sea foods can be harvested and processed more efficiently. Additional research in many problems is needed. Needed are pilot operations to determine if the laboratory developed techniques are applicable to mariculture. Needed are the development and testing of disease and predator control, production of more vigorous and faster growing "crops," and crops that will reach market size uniformly to allow machine harvesting. There are many other facets that need to be explored and perfected in order

that mariculture can compete with agriculture in the mass production of food."

MARINE ANIMALS:

Hydrophone Installation for the Study of Soniferous Marine Animals, by John C. Steinberg, Morton Kronengold, and William C. Cummings, Contribution No. 377, 6 pp., illus., printed. (Reprinted from The Journal of the Acoustical Society of America, vol. 34, no. 8, August 1962, pp. 1090-1095.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

MARINE BACTERIA:

"Marine Bacteria with Antiyeast Activity," by John D. Buck, Samuel P. Meyers, and Katherine M. Kamp, article, Science, vol. 138, no. 3547, December 21, 1962, pp. 1339-1340, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

MARINE BIOLOGY:

Preparation of Synopses on the Biology of Species of Living Aquatic Organisms, H. Rosa, Jr., FB/SI, processed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

MARINE MAMMALS:

"Locomotion in Pinnipeds," by Carleton Ray, article, Natural History, vol. LXXII, no. 3, March 1963, pp. 11-21, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y.

MARINE RESEARCH:

List of Marine Institutions in the Tropics (30° N. to 30° S.), FAO Fisheries Biology Technical Paper No. 20, 11 pp., illus., processed, distribution restricted. Fisheries Division, Biology Branch, Food and Agriculture Organization of the United Nations, Rome, Italy, June 1962.

MARKETING:

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COMMERCIAL FISHERIES REVIEW



VOL. 25, NO. 6

JUNE 1963

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor*
G. A. Albano,** H. M. Bearse, and H. Beasley, Assistant Editors

(*On special assignment for 7 months. **Acting Editor)

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington 5, D.C.

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BOTTOM FISH SURVEY OFF THE OREGON COAST, APRIL-JUNE 1961

By C. R. Hitz and D. L. Alverson*

ABSTRACT

Bottom fish surveys were conducted in the spring of 1961 by the U. S. Bureau of Commercial Fisheries with the exploratory fishing vessel John N. Cobb off the Oregon coast in areas not commercially exploited. The surveys were designed to (1) find areas suitable for trawling within and beyond the depth range now fished by commercial trawlers, (2) evaluate the commercial potential of ground fishes inhabiting those areas, and (3) study the depth distribution of fishes and invertebrates found. Trawlable grounds and concentrations of commercially-valuable ground fishes were found.

INTRODUCTION

From April 24 through June 15, 1961, an otter-trawl survey of the bottom fish faunas in selected areas off the Oregon coast was conducted from the Bureau's research vessel John N. Cobb. The survey was part of a long-range program initiated in 1950 to assess bottom fish stocks in the northeastern Pacific Ocean between southern Oregon and northwestern Alaska. Results of previous investigations have been reported by Ellson, Knake, and Dassow (1949); Ellson, Powell, and Hildebrand (1950); Alverson (1951, 1953); Greenwood (1958); Johnson (1959); and Hitz, Johnson, and Pruter (1961).

The survey was carried out in cooperation with the Oregon Fish Commission and the United States Atomic Energy Commission. Primary objectives were to (1) find areas suitable for trawling within and beyond the depth range exploited by commercial trawlers, (2) evaluate the commercial potential of ground fishes inhabiting areas found suitable for trawling, and (3) study depth distribution patterns of fishes and invertebrates found. Other objectives were to obtain samples of fishes and invertebrates for radiological analyses^{1/} and to tag live flounders (Pleuronectidae) for migrations and growth studies.

REGION INVESTIGATED

The region investigated includes the Continental Shelf and Continental Slope adjacent to the Oregon coast between the mouth of the Columbia River and the Siuslaw River. Work was conducted in two survey areas within that general region: (1) a portion of the Continental Shelf and Slope off central Oregon between Yaquina Head and the Siuslaw River at depths ranging from 35 to 300 fathoms, and (2) an area offshore in a southwesterly direction from the mouth of the Columbia River at depths ranging from 100 to 450 fathoms (fig. 1).

Major topographic features in the area investigated off central Oregon were Heceta Bank and Stonewall Bank. Heceta Bank is located west of the Siuslaw River, and Stonewall Bank is located approximately west of Newport, Ore. (fig. 1). A major topographical feature of the area surveyed off northern Oregon was the Astoria Canyon which approaches within 14 miles of the Columbia River mouth.

*Fishery Biologists, Exploratory Fishing and Gear Research Base, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

^{1/}By the Laboratory of Radiation Biology, University of Washington.

METHODS AND GEAR

Bottom fish studies in relatively confined regions of abruptly changing bottom topography or rocky or hard bottom must be accompanied by echo-sounding surveys so that area suitable for trawling can be located and defined. For such areas it is not practical to preschedule sampling stations. Methods used in this survey were similar to those described by Hitz, Johnson, and Pruter (1961). They included (1) conducting a detailed echo probe or search of the region with a high-resolution, white-line echo sounder, (2) dragging a heavy chain over the bottom in areas suggested by the sounding as being free of snags or other hazards, and (3) dragging an otter-trawl net in areas apparently suitable for trawling.

At the beginning and end of each otter-trawl drag the position was determined by means of loran bearings. In most instances, exploratory drags lasted 60 minutes and tagging drags lasted about 30 minutes. When catches were brought on board they were spilled into deck checkers and sorted by species. During the cruise, all species were identified and counted regardless of their commercial value so that a complete cataloging of all species taken was obtained. Length frequencies were recorded, and otoliths and scales were removed from selected species for subsequent age determinations. When

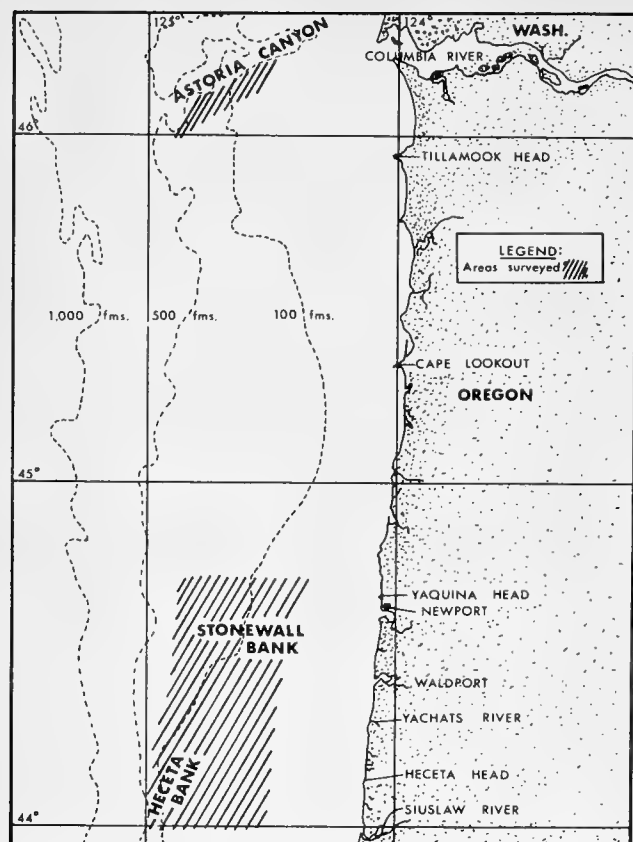


Fig. 1 - Region explored, Cruise 50, John N. Cobb.

catches were large (greater than 5,000 pounds), subsamples were normally taken to determine quantities and sizes of each species. Specimens that could not be identified aboard the vessel were preserved for later laboratory study.

At the end of each drag a sample of the bottom was taken with a Dietz-LaFond sampler and surface-to-bottom water temperatures were obtained from a bathythermograph cast. At depths greater than 150 fathoms a reversing thermometer was used to obtain bottom water temperatures.

A standard 400-mesh eastern otter trawl-net rigged according to commercial practice was used to sample fish populations (Greenwood, 1958). When chain drags were made, the net was removed and a $\frac{3}{4}$ -inch chain, 42 feet in length, was attached between the otter doors. A wet-or-dry-paper white-line echo sounder (38 kc., 220 v., 60 cycle/sec. having a maximum depth range of 1,750 fathoms) was used for sounding.

RESULTS

CENTRAL OREGON AREA: Most of the bottom in the area surveyed off central Oregon was found to be extremely irregular and hard, but several trawlable grounds of soft bottom were located. Figure 2 shows the echo-sounding transects made and gives the interpreted substrate features. The trawlable bottom included the following grounds: (1) a relatively large area of approximately 100 square miles at depths ranging from 75 to 200 fathoms, true west of Stonewall Bank, (2) an area of approximately 20 square miles at depths between 58 and 66 fathoms on the east side of Heceta Bank, (3) an area along the 100-fathom contour just west of Heceta Bank, (4) an area extending along the 100-fathom contour north of Heceta Bank, and (5) a small deep-water area extending from about 90 to 300 fathoms, offshore from Wald-

port. The grounds inside the 200-fathom contour line, which were not sounded, were considered to be fished normally by commercial trawlers.

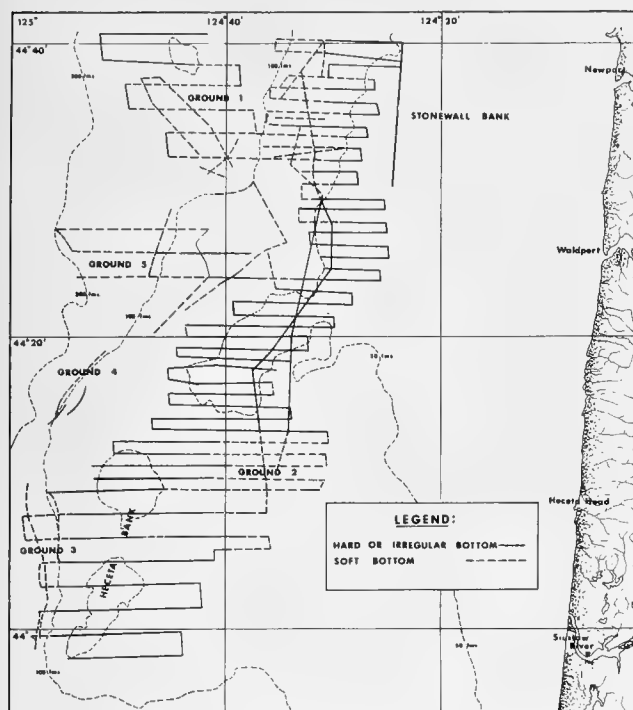


Fig. 2 - Sounding transects made off the central Oregon coast.

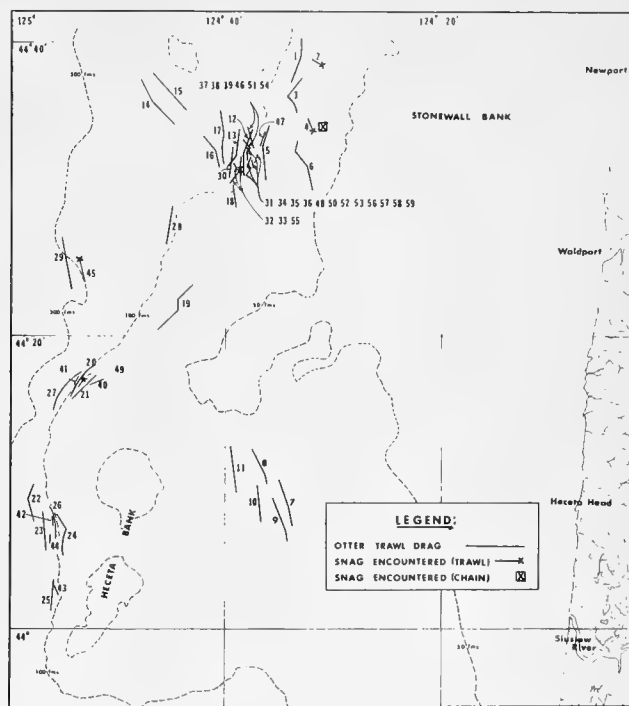


Fig. 3 - Location of net drags and snags encountered off the central Oregon coast.

Figure 3 shows the location of each drag made off central Oregon during this survey. Each drag is numbered and corresponds to the number in the fishing log provided in the appendix (available with the reprint of this article). The fishing log gives the pertinent data for each drag. Thirty-six drags were made in the trawlable area just west of Stonewall Bank (drags 1-6, 12-18, 30-39, 46-48, and 50-59). Of the total drags made on this ground, seven were unsatisfactory. Snags were encountered on two drags (drags 2 and 4) and the net was retrieved earlier than planned; the other five drags (drags 3, 6, 54, 55, and 59) were of the normal 60-minute duration, but considerable damage to the net resulted. Most of the gear damage and snags occurred in the shallower water around the 75-fathom contour adjacent to Stonewall Bank. Damage to the net that occurred on drags 54, 55, and 59 is believed to have been caused by outcroppings of coral. Successful drags were made in very close proximity to those which resulted in gear damage. Good catches made of Dover sole (*Microstomus pacificus*), sablefish (*Anoplopoma fimbria*), Pacific ocean perch (*Sebastes alutus*), and red rockfish (*Sebastes* sp.) are listed in table 1. Length frequencies of several species taken in this area are shown in table 2.

Drag No.	Depth in Fathoms	Minutes Towed	Dover Sole	Sablefish	Pacific Ocean Perch	Red Rockfish	Total Lbs. All Species
1	90	60	Trace	Trace	-	40	270
5	100	60	75	Trace	138	50	500
12	120	90	192	-	944	290	1,830
13	150	80	246	76	525	1,100	2,070
14	180	90	66	Trace	28	200	350
15	180	90	320	410	Trace	260	1,125
16	180	60	400	1,440	Trace	415	2,600
17	160	80	52	160	40	125	440
18	100	35	Trace	650	262	41	1,435
30	120	60	200	-	2,000	100	2,675
31	120	20	500	-	50	-	665
32	130	22	-	100	400	70	620
33	130	22	350	25	1,000	-	1,440
34	115	15	300	75	300	-	765
35	115	15	300	150	200	-	800
36	114	20	200	70	350	-	770
37	112	20	450	40	150	-	765
38	115	20	100	50	200	-	420
39	117	20	400	50	150	-	710
46	116	20	100	75	50	-	325
47	110	20	250	100	50	Trace	510
48	115	20	350	450	75	-	1,130
50	115	20	500	200	400	-	1,450
51	100	15	100	150	150	20	540
52	110	17	125	150	300	100	835
53	115	15	100	200	100	-	530
56	115	20	150	250	200	70	810
57	112	20	200	250	100	20	590
58	112	30	150	300	250	90	1,140

1/Trace = less than 20 lbs.

In the area located on the east side of Heceta Bank, five exploratory drags were made (drags 7-11). All of the drags except one resulted in chaffed and torn webbing, believed to

Table 2 - Representative Length Frequencies of Several Species Taken in Waters off the Oregon Coast

Area Sampled	West of Stonewall Bank						West side of Hecata Bank					West of Waldport			Southwest of the Columbia River				
Species	Sebastes (Rockfish)					Dover sole	Sebastes				Dover sole	Sablefish	Sebastes alascanus	Dover sole	Sablefish	Sebastes alutus	Sebastes alascanus	Sablefish	
	rubrivinctus	diploproa	crameri	flavidus	alutus		pinniger	saxicola	diploproa	alutus									
Drag No.	12	13	14	18	5,12	5,12,14,15	21	21	22	20	42,43,44	22	29	29	29	60	63	62	
Total Length in Centimeters	19	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	1	---	
	20	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	2	---	
	21	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	5	---	
	22	---	---	---	---	---	---	11	---	---	---	---	---	---	---	---	5	---	
	23	---	---	---	---	---	---	2	---	---	---	---	---	---	---	---	4	---	
	24	---	2	---	---	---	---	2	---	---	---	---	---	---	---	---	3	---	
	25	---	---	---	---	---	1	---	---	---	---	---	1	---	---	---	12	---	
	26	---	10	---	---	---	---	---	---	---	---	---	2	---	---	1	9	---	
	27	---	17	---	---	2	1	---	3	---	1	---	1	---	---	---	13	---	
	28	---	23	---	---	4	---	---	7	1	---	---	1	---	---	---	14	---	
	29	---	30	---	---	4	5	---	25	2	---	3	---	2	---	---	1	4	---
	30	---	51	---	---	9	6	---	20	4	1	5	---	3	---	---	3	6	---
	31	---	33	---	---	10	4	---	9	7	---	5	---	3	---	---	3	6	---
	32	---	24	---	---	9	12	---	4	24	1	14	---	4	---	---	5	6	---
	33	---	10	3	---	8	12	---	---	14	2	9	---	5	1	---	4	3	---
	34	1	3	3	---	5	24	---	---	26	---	19	---	4	5	---	4	3	---
	35	---	2	3	---	11	23	---	---	17	---	11	---	3	5	---	5	---	---
	36	---	1	7	---	9	34	---	---	15	3	16	---	3	6	---	6	1	---
	37	---	2	3	---	18	15	---	---	7	1	7	---	2	9	---	11	---	1
	38	---	---	4	---	10	24	---	---	---	---	13	---	3	9	---	13	1	---
	39	---	---	4	---	18	18	---	---	1	5	9	---	3	5	---	10	3	4
	40	1	---	2	---	16	20	---	---	---	15	6	---	2	4	---	17	---	1
	41	---	---	8	1	9	16	---	---	---	25	4	---	1	3	---	16	2	2
	42	1	---	5	8	7	12	---	---	---	18	11	---	2	6	---	9	---	9
	43	1	---	4	3	9	7	1	---	---	5	6	1	3	4	---	7	1	2
	44	---	---	---	14	3	7	3	---	---	7	6	---	---	7	---	1	---	12
	45	4	---	---	14	---	2	3	---	---	4	5	---	1	3	---	1	1	7
	46	3	---	1	20	---	5	3	---	---	9	4	---	1	---	---	1	---	7
	47	1	---	---	16	---	2	5	---	---	13	---	---	---	3	2	---	---	6
	48	3	---	1	11	---	3	5	---	---	9	---	---	---	---	1	---	---	2
	49	1	---	---	4	---	2	6	---	---	7	---	---	---	---	2	---	---	2
	50	5	---	---	8	---	1	7	---	---	1	---	---	---	1	6	---	---	2
	51	3	---	---	4	---	1	11	---	---	---	---	---	---	---	4	---	---	---
	52	5	---	---	4	---	1	3	---	---	---	---	---	---	---	6	---	---	2
	53	4	---	---	2	---	2	1	---	---	---	---	---	---	---	11	---	---	3
	54	1	---	---	---	---	---	8	---	---	---	---	---	---	---	6	---	---	---
	55	1	---	---	---	---	---	1	---	---	---	---	---	1	---	8	---	---	3
	56	1	---	---	---	---	---	---	---	---	---	---	---	---	---	11	---	---	---
	57	1	---	---	---	---	---	---	---	---	---	---	---	---	---	8	---	---	---
	58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4	---	---	1
	59	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5	---	---	---
	60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	1
	61	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---
	62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---
	63	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4	---	---	---
	64	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	1
	65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---
	66	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---
	67	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	1
	68	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---
	69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---
	70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---
	71	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	73	---	---	---	---	---	---	---	---	---	---	---	2	---	---	1	---	---	---
	74	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---
	75	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	76	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	77	---	---	---	---	---	---	---	---	---	---	---	1	---	---	1	---	---	---
	78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	79	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	81	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---
	No. in Sample	39	210	48	109	161	260	57	88	118	126	154	51	51	71	104	120	102	71
	Av. L. cm.	49.2	29.8	38.8	46.5	36.4	37.61	49.5	27.8	33.6	42.9	36.8	58.0	35.3	39.4	57.3	37.9	28.3	46.6
	Av. L. in.	19.4	11.7	15.3	18.3	14.3	14.8	19.5	10.9	13.2	16.9	14.5	22.8	13.9	15.5	22.6	14.9	11.1	18.3

have been caused by large boulders (fig. 4). The fish catch in that area was small, and the aggregate catches of all species did not exceed 300 pounds per drag.



Fig. 4 - Boulders commonly encountered in the area trawled on the east side of Heceta Bank.

The two trawlable grounds located on the west side of Heceta Bank were similar in bottom topography. A total of 8 drags were made on the southern ground (drags 22-26 and 42-44), and 6 drags were made on the northern one (drags 20, 21, 27, 40, 41, and 49). Large catches of up to 40,000 pounds were made on this ground with rockfishes being dominant. These catches of rockfish are shown in table 3. Representative length frequencies of rockfishes, Dover sole, and sablefish taken in the areas on the west side of Heceta Bank are shown in table 2. One 20-minute drag made



Fig. 5 - Eleven thousand pounds of Pacific ocean perch floating alongside the John N. Cobb.

Table 3 - Catch in Pounds of Rockfish Taken in the Areas Trawled on the West Side of Heceta Bank

Drag No.	Depth in Fathoms	Minutes Towed	Pacific Ocean Perch	Red Rockfish	Black Rockfish	Total Lbs. All Species
22	172-180	60	-	190	-	470
23	135-130	60	1,500	400	-	2,100
24	97-86	57	-	-	Trace	139
25	138-139	60	1,000	1,000	100	2,520
26	110-117	60	500	2,200	-	3,050
1/42	112	20	600	100	50	870
1/43	137	15	250	-	-	375
1/44	118	20	100	90	-	655
20	125-140	60	11,000	350	125	11,765
21	99-101	60	290	1,165	430	4,100
27	155-172	60	50	350	50	520
1/40	90-92	20	Trace	-	150	270
1/41	111-109	20	40,000	?	?	40,000

1/Tagging drags.

just northwest of Heceta Bank (drag 41) produced an estimated 40,000 pounds of Pacific ocean perch, the largest trawl catch ever made by the John N. Cobb. An attempt to repeat drag 41, resulted in considerable damage to the net (drag 49). Another large catch of 11,000 pounds of ocean perch (fig. 5) was taken in this area (drag 20).

Four drags were made in the small area west of Yachats River (drags 19, 28, 29, and 45). One of two shallower drags (drag 19 in 84-73 fathoms and drag 28 in 140-128 fathoms), drag number 28 provided good catches of Dover sole and Pacific ocean perch. In deeper water, in 260 to 300 fathoms (drags 29 and 45), only one drag was successful (drag 29). That drag was dominated by sablefish. Length frequencies of the dominant species taken in those drags are provided in table 2.

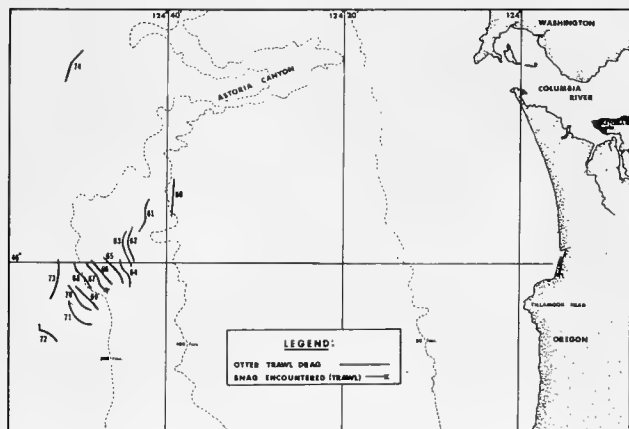


Fig. 6 - Location of net drags and snags encountered off the Columbia River.

rates in that depth increment ranging from 150 to 700 pounds per hour. Length frequencies of sablefish, Pacific ocean perch, and idiot rockfish (*Sebastolobus alascanus*) found in the area are given in table 2.

INCIDENTAL SPECIES TAKEN: In addition to commercial species, numerous unutilized species of fishes and invertebrates were taken. A complete list of species found (table 4), by depth zone, is given in the appendix to the reprint of this article.

TAGGING: Biologists from the Oregon Fish Commission tagged 5,429 Dover sole during the survey in the central Oregon area. The sole were captured at depths ranging from 90 to 137 fathoms.

SUMMARY AND CONCLUSIONS

In the spring of 1961, the Exploratory Fishing Section based at Seattle explored areas off the Oregon coast not under commercial exploitation. The surveys were conducted with the Bureau's exploratory vessel *John N. Cobb*, which was equipped with a high-resolution, low-frequency echo sounder, a chain that was attached between the otter doors and was dragged in place of a net, and a standard commercial otter trawl.

The order of procedure in surveying an area was to (1) run a series of echo sounding transects to determine the character of the bottom, (2) drag a heavy chain over areas suggested by sounding as being trawlable, and (3) drag a commercial otter-trawl net over those grounds on which the chain was successfully towed.

Trawlable grounds and concentrations of commercially-valuable ground fish were found in the areas surveyed. Although the bottom in the central Oregon area was found to be extremely irregular and numerous rocks and other snags were encountered during trawling, a number of successful drags were made without damage to the gear. In the few drags in shallower water in which no damage to the gear was noted, catches of fish were small with aggregate catches of all species not exceeding 300 pounds per drag. Most common species taken in the shallower drags were flatfishes, including Dover sole, English sole, and turbot. Exploratory drags made along the Continental Break and Continental Slope at depths from about 90 to 150 fathoms were more successful and numerous catches of Pacific ocean perch exceeding 1,000 pounds per drag were taken. Fair catches of Dover sole and sablefish occurred in some of the drags. In drags made in the area southwest of the mouth of the Columbia River, Pacific ocean perch, Dover sole, and sablefish were the dominant commercial spe-

cies taken. Catches of Pacific ocean perch ranging from 1,000 to 3,500 pounds per 60 minutes of fishing were taken at depths between 123 and 220 fathoms. Good catches of Dover sole were made at depths from 225 to 250 fathoms. Sablefish were common at depths ranging from 200 to 425 fathoms.

APPENDIX

A detailed fishing log showing the fishing positions, time on bottom, catch particulars, and other pertinent data for each drag is available as an appendix to the reprint of this article. Write for Separate No. 677 which contains "Otter Trawl Fishing Log - M/V John N. Cobb - Cruise 50 - Off Central Oregon and the Mouth of the Columbia River."

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HOW THE LARGE MESH WORKS

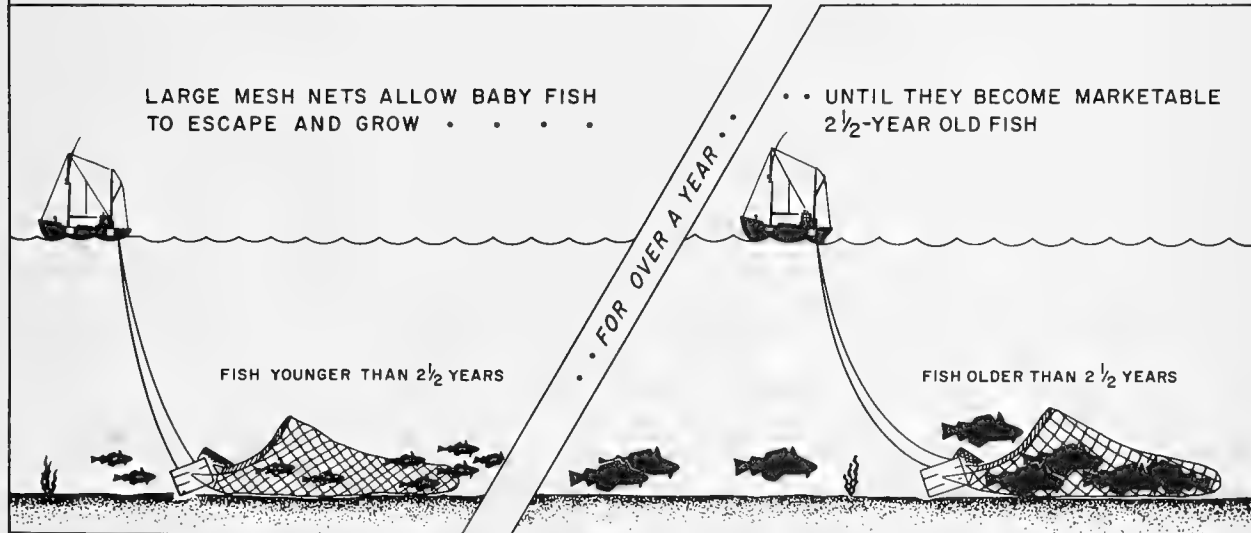
LARGE MESH NETS ALLOW BABY FISH
TO ESCAPE AND GROW

FISH YOUNGER THAN 2½ YEARS

• • UNTIL THEY BECOME MARKETABLE
2½-YEAR OLD FISH

FISH OLDER THAN 2½ YEARS

• • FOR OVER A YEAR • •



ACCURACY OF THE OFFICIAL METHOD FOR DETERMINING BREADING PERCENTAGES OF FROZEN RAW BREADED SHRIMP

By Mary E. Ambrose* and Charles F. Lee**

ABSTRACT

The accuracy of the method provided in the U. S. Standards for Grades of Frozen Raw Breaded Shrimp for determining breeding percentage was tested by preparing, freezing, and debreading samples of known breeding content. The varying conditions normal to commercial practice were simulated by preparing samples, using combinations of 3 types of batters and breaders, 3 species of shrimp, 2 methods of holding prior to breeding, and holding some samples in frozen storage. Storage samples were debreaded after 2, 4, and 6 months. The effects of operator differences and levels of breeding were also studied.

The data on apparent change in breeding content from 355 samples were statistically analyzed. It was found that iced or frozen storage of the shrimp prior to breeding did not affect debreading behavior significantly. There were small but significant differences in apparent change of breeding content, owing to species and batter variations. The average apparent change in breeding content for this series of samples was -0.57 percent, and the statistical limit for inclusion of 95 percent of the samples was 1.74 percent. The corresponding values for another series of samples prepared to test another commercial line of breaders and batters were considerably lower than these.

On the basis of these data, it is recommended that the correction factor used in the calculation of shrimp material be changed to 2 percent. There were small variations in apparent change in breeding content due to frozen storage, different operators, or levels of breeding, but they were not sufficient to affect the recommended correction factor.

INTRODUCTION

The voluntary Standards for Grades of Frozen Raw Breaded Shrimp (U. S. Department of the Interior, 1958) provides that the product contain not less than 50 percent by weight of shrimp material. To permit objective determination of compliance with the Standards, the staff of the Technological Laboratory at College Park, Md., developed a method of analysis for percent of shrimp in the product.

Inasmuch as all analytical methods have some degree of variability, a tentative correction factor of 5 percent has been used in the calculation of the percent of shrimp in determining compliance with the Standards. Owing to a lack of data on all the many variables involved, this correction factor was made somewhat large in order not to penalize the producer for uncertainties in the method of analysis. It is desirable, however, to make the correction factor as small as the accuracy of the method will permit, to ensure uniformity of product.

The purpose, therefore, of the work reported here was to determine the accuracy of the method under the many variable conditions encountered in the production of fro-

*Chemist

**Chemical Engineer

} Technological Laboratory, U. S. Bureau of Commercial Fisheries, College Park, Md.



Fig. 1 - This is the debreading machine that is in most general use by shrimp-breeding plants. The geared shafts on each side of the center shaft permit the use of double brushes but these are less effective for removal of breeding than the paddle.

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zen raw breaded shrimp in order to make a recommendation as to the magnitude of a revised correction factor.

EXPERIMENTAL

This study consisted of preparing frozen raw breaded shrimp of known breeding content and then analyzing the product by the official method for determining breeding content. The difference between the known content of breeding and the analytically determined content gave a measure of the accuracy of the analytical method.

PREPARATION OF SAMPLES: In the preparation of a sample of known breeding content, 20 peeled, deveined, and split shrimp, with tailfins attached, were weighed, the shrimp were battered and breaded by hand, the breaded sample was weighed, and the percent of breading actually applied was calculated. The samples were packed in waxed cartons, overwrapped with moisture-vapor-proof cellophane, and frozen by being placed in single layers on a shelf of a still-air freezer at 0° F. for at least 24 hours.

Breading percentages ranged from 23 to 54, most samples being in the range of 35 to 45 percent.

ANALYSIS FOR BREADING PERCENTAGE: The breaded samples were reweighed when removed from the freezer to make certain that the loss of moisture during freezing was negligible. The shrimp were then debreaded by the official method in the Standards for Grade of Frozen Raw Breaded Shrimp (U. S. Department of the Interior, 1958). Samples were analyzed within 2 weeks after being prepared, except those for frozen storage.

COMMERCIAL VARIABLES TESTED: Samples of known breeding content were prepared and analyzed to test the effect of the variable conditions occurring normally in the commercial manufacturing process. The commercial variables tested were types of batters and breaders, species of shrimp methods of handling shrimp in the shell--whether iced or frozen, and time the breaded product was held in frozen storage. A flow diagram of the study is given in figure 3.

Types of Batters and Breaders^{1/}: The wide variety of batters and breaders used in the industry could not be duplicated in the laboratory. Any effect of batters and breaders on the accuracy of the debreading method, however, would be largely due to the difference in time required to remove the breading. Therefore, the laboratory samples were prepared from a commercial breeder that is used in a number of shrimp-breading plants, designated in the tables as breader C, and two batters that were formulated from varying proportions of eggs, milk or water, and breader C to give the extremes of debreading behavior. The batter A combination was removed with difficulty and sometimes incompletely, but the batter B combination was removed easily. These two batters were used throughout the experiment to test the effects of the other commercial variables.

^{1/} "Batter" signifies dry batter mix, eggs and water or milk.

"Breeder" signifies dry commercial mix for breading.

"Breeding" or "breeding content" signifies the entire coating, both batter and breader.



Fig. 2 - The operator is adding a weighed sample of breaded shrimp to an experimental debreader. The principal of paddle agitation was found to give the most efficient removal of all types of breading.

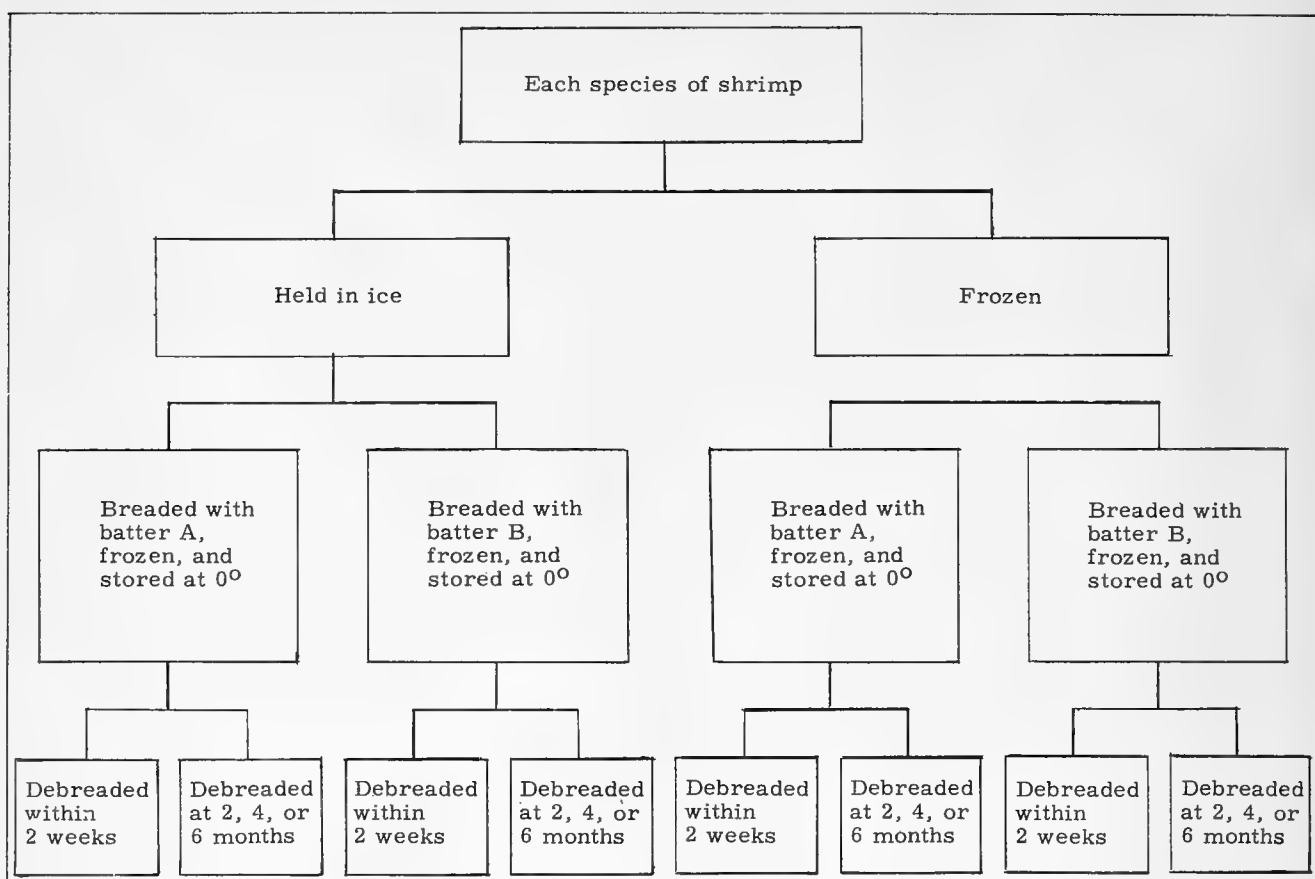


Fig. 3 - Flow diagram of treatment of samples breaded with breeder C for study of commercial processing variables.

Another series of samples was prepared to test a variety of batters and breaders obtained from another large commercial producer. These batters and breaders have been given the designation D. Some of the dry mixes were intended for use as both batter and breader and therefore are designated by the same number.

Species of Shrimp: Producers of breaded shrimp use any of the commercial varieties of shrimp that are of a proper size for breading. Samples utilized in this study were prepared from the following species of shrimp:

1. Brown shrimp (*Penaeus aztecus*) from the Gulf of Mexico (various ports).
2. Pink shrimp (*Penaeus duorarum*) from the Gulf of Campeche (Tampa) and Tortugas grounds (Key West).
3. White shrimp (*Penaeus setiferus*) from South Atlantic (Georgia).
4. "White" shrimp from Pamlico Sound (North Carolina). These shrimp were the color of the usual white shrimp, *P. setiferus*, and were purchased for white shrimp but were grooved, which is characteristic of brown and pink shrimp.

All brown iced shrimp were obtained from Brownsville and Tampa, and some of these were frozen in the shell. Some frozen brown shrimp were obtained locally, with no knowledge of the location of the packer except that they were produced in the United States. The data from samples prepared from these various lots of frozen brown shrimp were found to show no significant differences when analyzed statistically, so these data were combined.

The two lots of pink shrimp were handled separately, owing to the known wide separation in fishing grounds and the unusual data obtained from the samples prepared from pink shrimp from the Dry Tortugas grounds.

The Pamlico Sound shrimp were all obtained from one producer over a 3-month period during one season. Variations in debreading behavior were small from lot to lot, so these data were combined.

Brown iced shrimp from Brownsville, Texas, were used to prepare the samples to test D batters and breaders. Control samples were prepared from batter A and breaders C, as previously used.

Previous Handling of Shrimp: Almost all producers of breaded shrimp are located near shrimp-producing waters and use locally-caught shrimp when available. In off-seasons, they must rely on shrimp frozen in the shell either from their own storage or from other sources, including an increasing quantity of imports from other countries. The experimental lots of shrimp of each species were divided into two parts. One-half was shipped and held in crushed ice until breaded. The other half was frozen in the shell either before shipping or after arrival at the laboratory. After at least 5 days in frozen storage, these shrimp were thawed and breaded. Thus 2 series of samples were obtained from each species to correspond to the 2 holding conditions encountered in industry for the raw material.

Storage Studies: In addition to the debreading of samples immediately after they were frozen, samples were stored at 0° F. to determine the effect of frozen storage on the accuracy of the debreading process. Samples were debreaded after intervals from 2 to 6 months in 0° F. storage.

OPERATOR VARIANCE: The actual debreading process is mechanical and permits little variation between operators. After agitation, however, the shrimp are individually rinsed under a spray of water to remove loose particles of breading. A flick of the thumbnail is sometimes necessary to aid the spray of water to dislodge large areas of remaining breading. Although care is taken not to exert pressure of the fingers on the shrimp flesh, it is possible that different operators would obtain different results. The data were regrouped by debreading operators to determine if operator variance was significant. The debreading data from five operators were studied. Two of the operators were inexperienced.

VARIANCE DUE TO BREADING LEVEL: The debreading data were regrouped by breading levels, in ranges of 5 percent breading applied, from 30.1-35.0 percent to 45.1-50.0 percent. The purpose was to determine if the level of breading applied to the shrimp affected the accuracy of the debreading method.

RESULTS AND DISCUSSION

COMMERCIAL VARIABLES TESTED:
Species, Batter, and Handling Condition: A total of 355 samples were prepared from batters A and B and breaders C and were analyzed within 2 weeks. The effect of frozen storage will be considered separately. The number of samples for each combination of species, batter, and handling condition varied from 8 to 49. These data were subjected to statistical analysis. Significant differences were found for variations in species and batter but not for the previous handling of the shrimp. The data therefore were combined for the samples prepared from iced and frozen shrimp of each species and batter. The data for the testing of commercial variables except storage are presented in table 1.



Fig. 4 - The debreaded shrimp are drained on an inclined screen. The operator is picking particles of shrimp meat from the removed material, this operation is not normally required as the amounts of separated flesh rarely is enough to weigh on a gram scale.

Table 1 - Apparent Change in Breeding Content with Variations of Species of Shrimp and Batters

Shrimp Used			Batter ^{2/}	Number of Samples	Apparent Change in Breeding Content ^{1/}			
Species	Location of Catch	Number of Lots			Range	Mean	Standard Deviation ^{3/}	Statistical Limit for Inclusion of 95 Percent of Samples
..... (Percent)								
Brown	Gulf of Mexico	5	A	50	-3.6 to 2.8	-0.40	1.49	2.0
			B	32	-3.0 to 3.2	-0.15	1.33	2.0
Pink	Campeche	2	A	58	-4.4 to 1.4	-0.96	1.43	1.4
			B	59	-4.3 to 2.0	-0.96	1.41	1.4
Pink	Dry Tortugas	1	A	20	-3.3 to 4.5	-0.38	2.18	3.2
			B	21	-3.7 to 0.7	-2.10	0.81	-0.8
White	Georgia Coast	1	A	16	-0.6 to 3.0	1.06	1.23	3.1
			B	16	-3.6 to 1.1	-0.98	1.49	1.5
"White" grooved	Pamlico Sound	5	A	52	-4.6 to 3.3	-0.43	1.55	2.0
			B	31	-1.5 to 2.6	0.26	0.95	1.8
Total		14		355	-4.6 to 4.5	-0.57	1.41	1.74

1/Percent breeding by analysis minus percent breeding applied.

2/Batter A prepared from eggs, milk, and commercial breeder C.
Batter B prepared from eggs, water, and commercial breeder C.

3/Deviation from the arithmetic mean of the apparent changes.

1/Percent breeding by analysis minus percent breeding applied.

2/Batter A prepared from eggs, milk, and commercial breader C.

Batter B prepared from eggs, water, and commercial breader C.

3/Deviation from the arithmetic mean of the apparent changes.

The values obtained for individual samples for apparent changes in breeding content were both positive and negative for most groups of samples. All but two of the mean values were negative. The range or variation, however, was greater for some groups of samples than for others, as is shown by the values for the standard deviations.

Several groups of samples exhibited unusual apparent changes in breeding content. The mean values for Dry Tortugas pink shrimp batter B samples and the Georgia Coast white shrimp batter A samples showed unusually large deviations from the mean value for all samples. Also the Dry Tortugas pink shrimp batter A samples gave a very wide range for apparent changes in breeding content, resulting in a high standard deviation. These samples were prepared from only one lot of shrimp of each species and were therefore the smallest groups of samples analyzed. It is quite possible that further sampling of these species would result in values for the means and standard deviations more nearly approaching those for the whole series of samples.

These data indicate that the tentative correction factor of 5 percent is too large. A correction factor large enough to include 95 percent of the samples analyzed would properly protect the producer and ensure to the consumer a better and more uniform product at any stated level of breeding. The apparent change in breeding content which includes 95 percent of each group of samples is given in the last column of table 1. For the total number of samples the value is 1.74 percent, and of the groups of samples, only 2 small groups exceed 2 percent. It is therefore recommended that the correction factor be changed from 5 percent to 2 percent.

Table 2 - Apparent Change in Breeding Content with Various Combinations of D^{1/} Batters and Breaders Applied to Iced Brown Shrimp

Batter ^{2/}	Breeder ^{3/}	Apparent Change in Breeding Content ^{4/}			
		Range	Mean ^{5/}	Standard Deviation ^{6/}	Statistical Limit for Inclusion of 95 Percent of Samples
		<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
1	7	-5.4 to 0.9	-2.15	1.64	0.53
2	8	-3.7 to 0.4	-1.45	1.40	0.84
3	8	-3.0 to 1.6	-1.04	1.42	1.28
4	8	-4.3 to -1.2	-2.43	0.96	-0.86
5	5	-6.5 to -2.1	-3.56	1.40	-1.27
6	6	-5.2 to -0.5	-3.11	1.47	-0.70
A ^{7/}	C ^{8/}	-2.5 to 2.8	0.45	1.28	1.64

1/Commercial line of batters and breaders.

2/Dry commercial mixes with water.

3/Dry commercial mixes, some also used for batter preparation.

4/Percent by breeding analysis minus percent breeding applied.

5/Average of 10 samples.

6/Deviation from arithmetic mean of the apparent changes.

7/Control--eggs, milk, and breader C.

8/Control--commercial breader C.

Table 2 gives the data for the 60 samples prepared from D batters and breaders. Without exception the mean values were negative, and the statistical values for apparent change in breeding content that include 95 percent of the samples were all well below the suggested 2 percent.

Storage Studies: A total of 183 samples were stored for periods up to 6 months. For each group of a certain species and batter, the apparent change in breeding content varied somewhat from that of the respective samples not subjected to frozen storage. There was no trend in the changes with increasing storage time, and the magnitude of the changes did not affect the recommended 2 percent correction factor.

OPERATOR VARIANCE: There were very slight variations due to operators, but the effect of even the inexperienced operators was not sufficient to affect the recommended correction factor.

VARIANCE DUE TO BREADING LEVEL: When the data were regrouped by breeding levels, the apparent changes of breeding content were of the same general magnitude and showed no significant differences.

SUMMARY AND CONCLUSIONS

The apparent change in breeding content was studied on 355 samples of breaded shrimp prepared from a commercial breader, designated as C, and from different species of shrimp and batters, and with different holding conditions (iced or frozen) of shrimp in the shell. The difference between the actual breeding applied and the breeding content by analysis was taken as a measure of the accuracy of the method. No significant differences were found for the different holding conditions of the shrimp in the shell. There were differences due to variations in batter and species of shrimp. However, the statistical limit for inclusion of 95 percent of the samples for all combinations of species and batters supports the recommendation for a 2 percent correction factor for breeding percentage.

Another series of samples was prepared and analyzed for breeding content, using commercial batters and breaders from another manufacturer, designated as D. The apparent changes in breeding content for these samples varied significantly from control samples but in such a direction that they are all well below the suggested 2 percent correction factor.

A total of 165 samples were stored at 0° F. for periods up to 6 months duration. Differences were found for storage samples of some species and batters compared to the respective samples debreaded soon after being frozen, but there was no trend in the differences with increased storage time. No differences due to storage were sufficiently large to preclude the use of the suggested 2-percent correction factor.

The data from the major series of 355 samples were regrouped by debreading operators and then again by breeding levels. Only minor differences were apparent for either of these two factors.



As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

THE LINE-TRAWL FISHERY FOR COD AND HADDOCK AT CHATHAM, MASSACHUSETTS

By Albert C. Jensen* and Robert K. Brigham**

ABSTRACT

The line trawl was developed in New England about 100 years ago and, until the introduction of the more efficient otter trawl, was the principal gear used in the cod and haddock fishery. Line trawls are still fished today from small boats, particularly over bottom too rough for otter trawling.

Chatham, Mass., is the home port for a fleet of line trawlers that fish with two-man crews and land the fish in prime market condition. Annual landings are on the order of 1.7 million pounds, mostly cod and haddock. The gear, the boats, the fishing operation, and the catch of the Chatham fleet are described and illustrated.

INTRODUCTION

The line trawl was once the principal gear used by the New England fishing industry but it has been replaced by the more efficient otter trawl, particularly on the off-shore fishing grounds. However, the old style gear is still used in many parts of New England. On some fishing grounds it is the only gear that can be used because the bottom is too rough for otter trawling. This article is an attempt to document the fishery as it exists today at one of the New England centers of line-trawling fishing, Chatham, Mass.

FISHING GEAR

In other parts of the country this gear is sometimes called a long line, but in New England it is called a line trawl. It was developed from the older hand line and consists principally of a horizontal ground line with short ganging lines, each with a baited hook, attached at intervals. Two similar types of gear, a halibut long line and a steel cable long line, are illustrated by Dumont and Sundstrom (1961).

A "tub of trawl" is the unit of gear. The tub itself is a half barrel and is the container in which the trawl is stored before and after it is fished. The gear (table 1) consists of 10

Table 1 - Specifications of Chatham Line-Trawl Gear

Item	Size or Weight	Approximate Dimensions	Material
Ground lines	18 lbs. per 50-fathom bundle	3/16-1/4" dia.	Tarred cotton or nylon
Ganging lines	3-1/2 lbs. per 50-fathom bundle	1/16-3/32" dia.	Tarred cotton
Buoy lines	32 lbs. per 50-fathom bundle	3/8-1/2" dia.	Tarred cotton or manila
Hooks	6/0 Pflueger	2" length over-all	Steel
Anchors	12 lbs. at start of string	36" length over-all 24" width across flukes	Steel
	6 lbs. at end of string	30" length over-all 20" width across flukes	
Kegs	8-gallon capacity	12-1/2" dia. at bulge	Wood
		18-1/2" length over-all	
Poles	14 feet long	1-1/2 to 2" dia. at butt end	Bamboo or Calcutta cane

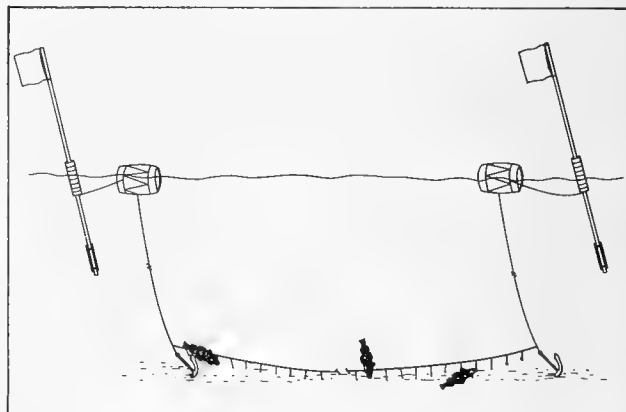


Fig. 1 - Diagrammatic sketch showing the layout of a New England line trawl in a fishing position. The details of the parts of the trawl are described in table 1.

*Fishery Biologist (Research)
**Photographer, Biological Laboratory

U. S. Bureau of Commercial Fisheries, Woods Hole, Mass.

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connected sections of ground line, each 50 fathoms long. Lengths of ganging with 6/0 hooks are fastened to the ground line at 6-foot intervals. Thus there are about 500 hooks per tub of trawl. The length of the ganging varies and depends on the height of the vessel's rail above water, and is gauged to enable the fishermen to bring the fish into the boat in an easy operation.

When the trawl is fished, it is rigged in strings consisting usually of $1\frac{1}{2}$ tubs of trawl. Sometimes two tubs will be set in a string. A $1\frac{1}{2}$ tub string consists, then, of a ground line 4,500 feet long with about 750 hooks. A cane pole with a small flag is attached with a 10-foot-length of buoy line to a wooden keg and floats on the surface as a marker at each end of the string. The kegs are connected with long buoy lines to anchors that hold the ground line on the bottom (fig. 1). The boats from Chatham usually fish in depths of from 20 to 30 fathoms.

LINE TRAWL BOATS

The vessels engaged in the Chatham line-trawl fishery are of the type known as a Cape Island or Jonesport boat. The basic design of the vessel is described by Chapelle (1955). Locally they are called "Novie (Nova Scotia) boats", or "Novie lobster boats." A typical Chatham boat (fig. 2) is 33.7 feet long, 11.0 feet beam and 4.9 feet draft, and is registered at 13 gross tons and 12 net tons. It is powered by a 165 h.p. gasoline engine and carries a two-man crew.

FISHING OPERATIONS

A typical day of line-trawl fishing at Chatham begins about 2:00 a. m. (two hours later in the winter) when the fishermen bait the hooks and coil the line in the tubs preparatory to steaming out to the fishing grounds. The kind of bait that is used depends on its availability and the season. Squid is sometimes used in the summer, particularly when fishing for cod. Mussels or sea clams are used in the winter. Cut, frozen herring is often used, particularly when the other kinds of bait are not available.

The boats leave the pier about 3:00 or 4:00 a.m., often taking advantage of high tide to get over the shallow entrance to the harbor. Final baiting of hooks and other preparation of the gear are done on the way to the grounds. The most productive ground is "The Mussels" located about 18 miles south-southeast of Pollock Rip lightship. The bottom here is too rough for otter trawls but yields excellent catches of groundfish, particularly cod (Gadus morhua) and haddock (Melanogrammus aeglefinus), to the line trawlers.

When the vessel reaches the fishing ground the gear is set out. A flag and keg are set over the side and the buoy line paid out by flipping it over the after port rail with a short, wooden "heaving stick." Then, the first anchor is dropped. The ground line with the attached ganging lines and baited hooks are next flipped out with the heaving stick (fig. 3). Finally the second anchor and a keg and flag are set out. The trawl is now fishing on the bottom.

Sometimes only one tub is set out and allowed to "soak" for as long as it takes the boat to return to the first buoy. The gear is immediately hauled back and the abundance of food fish determined by the catch on the line. If the catch is good, 2, 3, or 4 strings may be set; the first string is hauled back as soon as the last one is set. Hauling back (figs. 4, 5, 6 and 7) is simply a reversal of the setting out procedure. The first keg and flag are hauled into the boat and then the buoy line is hauled in over the roller-rail. When the anchor is brought into



Fig. 2 - The Hazel Y., a 34-foot-long Chatham vessel engaged in the line-trawl fishery.



Fig. 3 - Setting the trawl. As the boat moves ahead about half speed, the ground line, with the attached ganging lines and baited hooks, is flipped clear of the tub with a light, wooden stick.

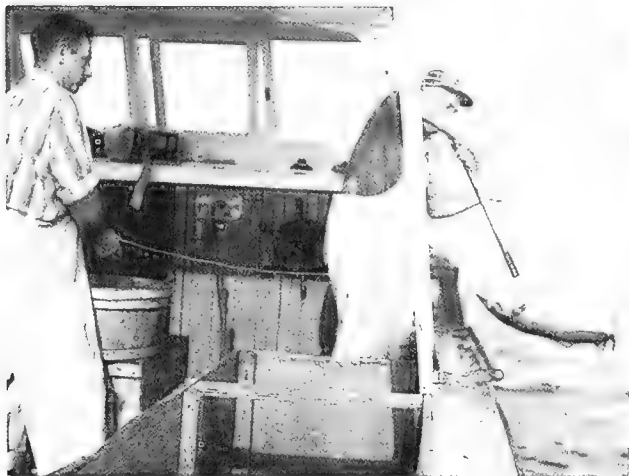


Fig. 5 - A gaff is used to boat large fish, particularly the soft-mouthed haddock, as shown here. As one man hauls in the line and handles the fish, the second man coils the gear into the tub.



Fig. 4 - The ground line with a hooked haddock is hauled back hand-over-hand. The fisherman's hands are protected by doughnut-shaped, woolen "nippers" that insure a firm grip on the line but permit bare-finger freedom of movement.



Fig. 6 - When a fish is brought aboard it is "slatted off" the hook into the fish box (foreground).

the boat, the ground line is unfastened and hauled in, hand-over-hand, over the roller-rail. One man hauls in the line and maneuvers the boat by adjusting the wheel and engaging and disengaging the clutch, thus keeping the boat broadside to the line. The other man coils the gear into the tub. A gaff is used to haul in large fish, especially the soft-mouthed haddock, that might otherwise drop off the hook. Food fish are placed in pens on each side of the cockpit; unwanted fish and unused bait are shaken off the hook to fall back into the water. As the gear is coiled back into the tubs it is examined for damaged hooks or frayed ganging and ground lines. At the end of the ground line the last anchor, keg, and flag are hauled into the boat.

In the summer months, large sharks, particularly the blue shark (*Prionace glauca*), cause a great deal of damage to line trawls. The sharks may tangle the ground line into a hopeless snarl and often bite the ground line and sever it. Spiny dogfish (*Squalus acanthias*) are another serious pest. Frequently they devour the bait and are hooked, or feed on the hooked cod and haddock leaving only the head and part of the spinal column. When spiny dogfish are very abundant, the line trawlfishermen are unable to use the gear and resort to jigging with hand lines and artificial lures.



Fig. 7 - Coiling the gear back into the tub. During this operation the fisherman checks for damaged hooks or worn or frayed ganging and ground lines.

The catch is dressed as the vessel returns to Chatham (fig. 8). During the winter months, when the fish are not as abundant and the most productive grounds are not readily accessible, a good trip will average about 2,000 pounds of dressed fish. During the summer months a good trip will average about 3,000 pounds of dressed fish, and under ideal conditions line trawlers occasionally land 3,500 to 4,000 pounds per trip.



Fig. 8 - All the fish are eviscerated and the large cod are beheaded as the vessel returns to port. The catch includes cod, with the light line on the side, and haddock, with the dark line on the side.

The vessels usually return to the Chatham fish pier about 3:00 p.m. The fish are unloaded with a pitch fork from the boat to a large steel bucket that is hoisted to the dock when full. The bucket slung from an overhead rail, then is rolled into the packing house. After the catch is unloaded (figs. 9, 10, 11, and 12), the species are separated by hand and packed with ice in wooden boxes. The Chatham boats carry no ice but the catch is landed within 4 or 5 hours of the time the fish are taken from the water and thus is quite fresh when boxed for shipment. The boxes are then shipped in refrigerated trucks to New York, Boston, and other nearby eastern cities. The cod are sold mostly in the New York area whereas the haddock are sold mostly in the Boston area. This separation of species is dictated by consumer preferences in those areas.

LANDINGS

Over the 5-year period 1957-1961, food fish landings at Chatham averaged about 1.7 million pounds a year (table 2). The size distribution of a sample of 207 cod caught by a Chatham line-trawl vessel is shown in table 3. It is noteworthy that in the cases of cod and haddock, almost no scrod (fish that weigh $1\frac{1}{2}$ to $2\frac{1}{2}$ pounds, gutted) are landed. The majority of the fish are in the "large haddock" (more than $2\frac{1}{2}$ pounds, gutted) and "market cod" ($2\frac{1}{2}$ to 10 pounds, gutted) categories. This is in contrast to otter-trawl landings where scrod cod and scrod haddock (particularly the latter) make up a large part of the landings of the two species. Presumably this is because the smaller fish are not easily caught by the relatively large, baited hook of the line trawl.

A small-scale fishery of this type has some advantages that cannot be matched by fisheries using more complex gear, and the capital outlay for the boat is considerably less. From the fisherman's viewpoint, the line-trawl fishery yields a comparatively large quantity of high quality fish that bring a very good price with a relatively low overhead cost. The quality of the fish is maintained by the 1-day delivery schedule, and the product is sought by



Fig. 9 - Tying up at the pier to unload the catch. At Chatham most of the vessels return about midafternoon so usually there is a lot of shifting of lines as each vessel takes its turn to unload.



Fig. 10 - Unloading the catch. An average good trip will yield about 2,500 pounds of fish, mostly cod and haddock.



Fig. 11 - A pitch fork is used to transfer the fish from the vessel to the bucket. When the bucket is filled it is hoisted to the top of the pier.



Fig. 12 - The bucket of fish is moved on an overhead trolley into the packing room. The fish are separated by species and packed with ice in wooden boxes for shipment to Boston, New York and other eastern cities.

Table 2 - Annual Landings at Chatham, Massachusetts, 1957-1961

Species	1961	1960	1959	1958	1957
	..... (1,000 Pounds)				
Cod:					
Large.....	741	523	566	450	515
Market.....	293	468	570	198	159
Scrod.....	5	-	-	-	-
Total Cod.....	1,039	991	1,136	648	674
Haddock:					
Large.....	902	788	584	697	707
Scrod.....	-	-	-	-	2
Total Haddock.....	902	788	584	697	709
Hake, White.....	5	4	7	10	11
Wolffish (Catfish) ..	6	8	10	8	18
Halibut.....	26	11	10	14	15
Misc. species.....	41	52	48	21	14
Total Other Species	78	75	75	53	58
Grand Total.....	2,019	1,854	1,795	1,398	1,441

Table 3 - Percent Size Composition and Market Classification of a Sample of Cod Caught by a Chatham Line Trawl

Length Class	Number of Fish	Market Category ^{1/}
<u>Centimeters</u>	<u>Percent</u>	
21-30	0.5	} sub-market (released)
31-40	3.0	
41-50	16.9	
51-60	24.1	} market
61-70	19.3	
71-80	15.9	
81-90	13.0	
91-100	6.3	} large
101-110	1.0	
	100.0	

^{1/}Market category is approximate. In actual practice the categories are based on weight and not length of fish.

and sparing the smaller, younger fish for later harvest. In summation, the Chatham line-trawl fishery appears to be in the fortunate position of supplying a high quality food product to a ready market under economic and biological conditions that suggest stability of the fishery for the future.

the restaurant trade and the fresh fish markets. Furthermore, from the biological viewpoint, the line trawls tend to conserve the fishery by removing the larger and older fish

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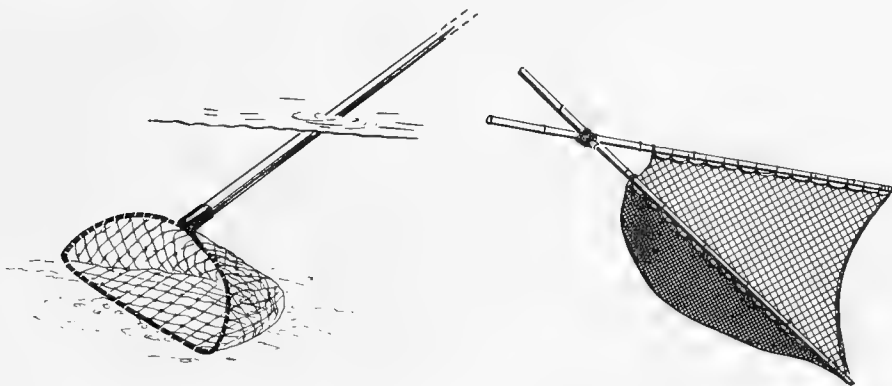
DUMONT, W. H. and G. T. SUNDSTROM

1961. Commercial Fishing Gear of the United States. U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Circular 109, 61 pp.



PUSH NET

A push net is a modification of a dip net. It is constructed of a shallow wire or webbed mesh bag attached to a wooden or metal frame which has a handle. In fishing, it is pushed over the bottom in shallow water.



Push nets.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

TRENDS AND DEVELOPMENTS

Alaska

JAPANESE FISHERMEN NOT EXTRADITED FOR VIOLATION OF FISHING REGULATIONS:

The State Attorney for Alaska stated on March 16, that Alaska did not plan to extradite three Japanese fishermen arrested in April 1962, during the Shelikof Straits controversy. The captains of three vessels of a Japanese herring fishing fleet were arrested by State of Alaska enforcement agents and charged with violating Alaska's commercial fishing regulations. They were later released on bail and returned to Japan. Reports were that Japanese fishing companies proposed to purchase herring in the Cordova area and chum salmon in the Ketchikan area. The State of Alaska feels the Japanese have, because of those developments, changed their policy in regard to fishing in State claimed waters. Therefore, they considered it unnecessary to press for extradition of the Japanese fishermen arrested in 1962.

* * * * *

FOREIGN FISHING ACTIVITIES IN BERING SEA AND GULF OF ALASKA:

Soviet and Japanese fishing activity began building up during March. About 120 to 140 Russian vessels were fishing from the vicinity of Unimak Pass northward to the area of the Pribilof Islands. As in past years, they were utilizing the Bering Sea ice pack for protection from the bad weather prevalent in that area during winter and spring. By month's end, Soviet trawlers were sighted in the Gulf of Alaska fishing for Pacific ocean perch, presaging an early return to the grounds the Russian fleet apparently found profitable during the summer of 1962.

The Japanese stern trawlers Akebono Maru No. 51 and No. 52 conducted winter exploratory fishing operations in both the Gulf of Alaska and Bering Sea. By the end of March both vessels were en route to Japan.

The Chichibu Maru accompanied by seven 260-ton trawlers, Nisshin Maru Nos. 50 to 55 and Taiyo Maru No. 11, began fishing for shrimp in the vicinity of the Pribilof Islands early this year. At the end of March, they were reported to be in the vicinity of Unimak Island where they were making good catches.

The freezer ship Chichibu Maru No. 2 and six catcher vessels departed Japan on February 25 and were believed to be fishing on the Eastern Bering Sea trawling grounds.

* * * * *

EXPANSION OF RUSSIAN AND JAPANESE KING CRAB FISHING INTO GULF OF ALASKA PREDICTED:

Japanese sources were quoted as predicting the expansion of the Soviet Union king-crab fishing in 1963. It was reported that the Russians may move south of the Alaska Peninsula with at least two crab factoryships during the coming season. Previously the Soviets had confined their king-crab operations to the Bristol Bay area.

Translations of various Soviet fishery journals reported the arrival in Vladivostok of additional new units to the Soviet Far Eastern crab fleet, including the ultra-modern vessels Aleksander Obukhov, Eugenii Nukishin, and Pavel Chebotniagin. Those vessels are sisterships to the earlier Andrei Zakharov, and are in addition to the ten older fleet units extant. In addition, the Japanese press reported



Russian king crab factoryship Andrei Zakharov.

the factoryship Kyokusei Maru (5,504 gross tons) and eight catcher vessels have been licensed to fish for king crab in the Gulf of Alaska for six months beginning in May.

Should those developments take place, it was anticipated there would be protests from members of the developing Alaskan king crab industry and from various public officials. It was also expected that the gear conflict and interference problem might be accentuated.

* * * * *

JAPANESE FIRM SHOWS INTEREST IN PURCHASING ALASKA SALMON:

News that a Japanese firm may buy chum salmon in Southeastern Alaska was widely circulated in Ketchikan fishing circles during March. First reports were that a cold-storage plant in Alaska had arranged for the Japanese "mothership" to purchase salmon directly from the fishermen, and processing and freezing them aboard the vessel for the Japanese market. However, problems developed with that proposal. A newer plan was for the Alaskan cold-storage plant to do the processing and freezing with the Japanese firm taking delivery at the cold-storage dock. But some questions were raised as to how successful such an operation would be. An official of the cold-storage plant stressed that the proposed deal includes provision that the chum salmon would not be reexported to the United States.

* * * * *

WINTER CATCH OF HERRING FOR BAIT LOWER:

The annual winter harvest of herring for bait in the Ketchikan area was completed in March. For the second consecutive year herring did not appear in abundance in Revilla Channel but were caught in more distant waters. The total catch was considerably below the approximate 2.5 million pounds caught in 1962 because of cold-storage holdovers, more bait fishing conducted westward, and increasing use of alternate baits for halibut.

* * * * *

VESSELS PREPARE FOR EARLY HALIBUT FISHING SEASON:

Approximately 30 halibut vessels loaded ice, bait and supplies at Ketchikan in mid-March prior to departing for the Bering Sea

for the opening of fishing on March 25. Several of the boats carried cargoes of octopus bait from Ketchikan to cold-storages in westward Alaska. The first trip of Bering Sea halibut was expected to arrive in Ketchikan during the week of April 8.

* * * * *

CHIGNIK RIVER RED SALMON FORECAST FOR 1963:

Chignik (Alaska Peninsula) runs of red salmon during the past 10 years ranged in size from 410,000 to 1,425,000 fish and averaged slightly over 800,000 fish annually. The forecast for 1963 is 1,348,000 fish. It was reported that possible errors in the forecast method used at Chignik, including variations in ocean survival, sampling error, and escapement enumeration error, could cause sizeable deviation from the 1963 prediction.



Alaska Fisheries Investigations

The following is a report of the March 1963 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auks Bay, Alaska.

PINK SALMON SPAWNING CHANNEL AT OLSEN BAY TO BE IMPROVED:

Representatives of the U. S. Bureau of Commercial Fisheries, the U. S. Forest Service, and the Alaska Department of Fish and Game agreed on a proposed plan for the general design and operation of an improved pink salmon spawning channel at the Olsen Bay research station at Prince William Sound. The channel will be in two sections--one in the intertidal area and the other above high tide. It will be the first salmon spawning channel on the Pacific coast to be located in an intertidal area. In the Prince William Sound area, most pink salmon spawn naturally in intertidal reaches of streams.

Olsen Creek produces large but fluctuating runs of pink salmon. The Channel will offer an excellent opportunity to develop methods of obtaining more consistent production through control of the spawning environment. Techniques for controlling the wide natural fluctuations in pink salmon production may be of importance to future salmon management.

The Forest Service will assume a major role in the venture by doing topographical

surveys and installing the channels. The Auke Bay Laboratory staff will operate the spawning facilities and evaluate the results.

* * * * *

WINTER PINK AND CHUM SALMON EGG SURVIVALS ENCOURAGING:

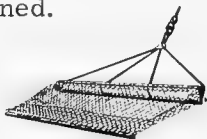
Crews sampled salmon eggs from study areas in a pink salmon stream near Cordova and a chum salmon stream near Ketchikan. Preliminary results indicated that the egg survival of both species will probably prove to be better than average.



Alaska Fisheries Exploration and Gear Research

SHRIMP AND SCALLOP STUDIES PLANNED:

Shrimp explorations planned by the U. S. Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base at Juneau will include about 11 weeks of trawling in southern Cook Inlet near Kodiak Island. The primary emphasis of the scheduled 1963 shrimp explorations will be to supplement and extend the work previously done in Cook Inlet. Preliminary scallop dredging to determine the feasibility of more intensive work is also planned.



California

NEW DIRECTOR APPOINTED FOR INSTITUTE OF MARINE RESOURCES:

Dr. Milner B. Schaefer was recently appointed Director of the University of California's Institute of Marine Resources. He was formerly the Director of Investigations for the Inter-American Tropical Tuna Association, La Jolla, Calif. Announcing the appointment, the President of the University of California said, "With the appointment of Dr. Schaefer, one of the country's leading fisheries biologists, we hope to strengthen the Institute's Program. Among critical programs that need to be explored in a broadened program are the socio-economic ones that handicap effective use of fisheries and marine resources."

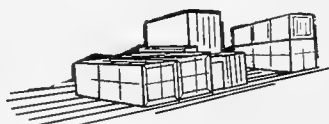
Some of the studies now being carried out by the Institute are: (1) consideration of the potential resources of the sea in relation to needs of an increased population; (2) research on the productivity, ecology and population dynamics of living resources; (3) the composition of fishes, especially the nature of proteins and unsaturated fatty acids; and (4) studies of the topography of the deep-sea floor and research on beach erosion formation and other inshore geological processes. (*Undersea Technology*, January 1963; U. S. National Oceanographic Data Center, *Newsletter*, March 31, 1963.)



Cans--Shipments for Fishery Products, January-February 1963

A total of 354,448 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-February 1963, a decline of 2.2 percent from the 362,242 base boxes used during the same period in 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.



Central Pacific Fisheries Investigations

PREDICTIONS ON ABUNDANCE OF SUMMER SKIPJACK TUNA IN HAWAIIAN WATERS:

Studies by the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries on skipjack tuna and its environment have demonstrated there is empirical relationship between the relative abundance of skipjack in Hawaiian waters and oceanographic conditions. This relationship has enabled the scientists to predict to Hawaiian fishermen the availability of skipjack several months in advance of the season. These predictions have been made with a high degree of success since 1959. The forecast

of availability is based on monthly sea surface temperatures which are recorded from the Koko Head monitoring station on the Island of Oahu. In January, the sea surface temperature in the vicinity of Oahu is about 74° F. Near the end of the summer the temperature may approach 79° F. and then drops to 74° F. again by the end of the year. From this cyclical change in temperature, a curve of the rate of sea-surface temperature change at Koko Head is derived. This rate-of-change curve shows that the sea surface temperature changes from a cooling phase to a warming phase in February or March. The relative abundance of skipjack in Hawaiian waters during the summer fishing season is related to the time of temperature-rate change from the warming phase to the cooling phase. Highest yields of skipjack are obtained when the onset of sea-surface warming occurs in early February. Yields decline as the time of warming progresses toward March, and the lowest yields are expected when the time of warming occurs in the middle of March. Warming in 1963 occurred in early February. This resulted in a prediction to the industry that the skipjack fishery will be above average this coming summer.

Although it is now a simple matter to predict the relative abundance of skipjack for each summer several months in advance of the season, the biologists still do not have a complete understanding of the mechanisms involved. It appears that skipjack schools move into the Hawaiian area with a seasonal northward movement of the California Current Extension water. The skipjack which appear in the Hawaiian summer are of unusually large size (about 22 pounds). Skipjack of that size are not common in the other major Pacific fisheries. The scientists claim that these large skipjack belong to a different subpopulation than the smaller skipjack which are found throughout the year in the Hawaiian area. At present the Laboratory is endeavoring to discover why the prediction works. In order to do this, a more detailed understanding of the subpopulation structure of the skipjack is needed, plus the various environmental variables which influence the skipjack's movements, availability, and abundance. As a more complete knowledge of skipjack biology is attained it will become possible to relate the Laboratory's observations in the Hawaiian area to the skipjack exploited in other parts of the Pacific. It is possible that the skipjack which support the Hawaiian fishery are also being exploited in

some other fishery or could be exploited in some potential fishery. Investigations of the phenomena related to the predictions have led to several interesting hypotheses. One of these hypotheses concerns the fact the immunogenetic studies have demonstrated that there are at least two subpopulations that enter the Hawaiian fishery. It is hypothesized that the large "season fish" which enter the Hawaiian fishery in the summer belong to one of those subpopulations. The biologists speculate that the increase in catch that occurs during the summer may be due to an increase in availability of the skipjack. It is hypothesized that this increase in availability is associated with the angle of inflection of oceanic currents that pass by the Islands--angles of high inflection produce a turbulent condition which increases the density of skipjack forage at the surface. Increased surface forage results in higher densities of skipjack near the surface and this establishes the possibility of higher yields to the fishermen in years when this combination of conditions prevails. As a fuller understanding of these phenomena is obtained, a store of knowledge is being acquired which will enable the biologists to understand the fluctuations and vagaries of skipjack populations on a Pacific-wide basis.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1963:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased in January 1963 by the Defense Subsistence Supply Centers than in December 1961. The increase was 51.4 percent in quantity and 84.7 percent in value.

Compared with the same month a year earlier, purchases in January 1963 were up 19.3

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, January 1963 with Comparisons

QUANTITY		VALUE	
January		January	
1963	1962	1963	1962
• (1,000 Lbs.) •		• (\$1,000) •	
2,089	1,751	1,546	996

percent in quantity and 55.2 percent in value. The greater increase in value was due mainly to heavy buying of higher-priced fishery products such as shrimp and oysters

in January 1963. Prices paid for fresh and frozen fishery products by the Department of Defense in January 1963 averaged 74.0 cents

a pound, about 17.1 cents a pound more than was paid in January 1962.



Canned: Canned sardines was the principal canned fishery product purchased for the use of the Armed Forces in January 1963.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, January 1963 with Comparisons

Product	QUANTITY		VALUE	
	January		January	
	1963	1962	1963	1962
	.. (1,000 Lbs.) ..		.. (\$1,000) ..	
Tuna	-	3,113	-	1,739
Salmon.	3	-	2	-
Sardine.	37	3	15	2

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, May 1963 p. 26.



Fish Meal

CORN-COTTONSEED RATIONS FOR PIGS IMPROVED:

Recent research has demonstrated that corn-cottonseed rations for pigs can be improved by the addition of fish meal to the mixture. When menhaden meal was substituted for a part of the protein of cottonseed meal in a corn-cottonseed ration for pigs, rate of gain, efficiency of feed utilization, and area of the loin eye were improved significantly. Fish meal was substituted for cottonseed meal so as to replace 4 percent of the protein of the latter with fish meal protein. When only 2 percent of the cottonseed protein was replaced by fish meal, the ration was improved, but results were less significant than when 4 percent of the cottonseed protein was replaced by the fish product.

The improvement of corn-cottonseed meal rations at relatively little added expense is a matter of great practical importance in some southern States where cottonseed meal is frequently the least expensive source of protein for livestock.

Cottonseed meal in its original form contains the toxic agent, gossypol, a chemical compound that can injure pigs and some other animals if present in appreciable amounts. Chemical treatment of the meal reduces free gossypol to levels that can be tolerated by pigs. However, whether or not growth is retarded by the small amount of free gossypol remaining is still open to question. In the experiments referred to, although free gossypol in the rations never exceeded 0.0075 percent—a level that would not ordinarily be expected to inhibit growth—the fact that performance was improved by the presence of fish meal possibly may be attributed to an alleviation of a growth-inhibiting effect of gossypol. Another possible explanation of the beneficial effect of fish meal is that the lysine (an indispensable amino acid) in the fish meal may have improved the amino acid balance of the ration.

From a practical point of view, the experiments demonstrate that some corn-cottonseed meal rations can be improved significantly by the addition to the ration of small amounts of fish meal. The experiments were reported at

the Maryland Nutrition Conference, Washington, D.C., March 14-15, 1963, by Professor E. P. Young, University of Maryland and R. R. Kifer, U.S. Bureau of Commercial Fisheries, College Park, Maryland.



Fish Oils

MONO- AND DI-NITRATES DERIVATIVES MAY HAVE INDUSTRIAL USES:

The chemistry of organic nitrates, historically associated with the preparation of explosives, is becoming increasingly important. In contrast to the explosive character of polynitrate esters, such as nitroglycerin and nitrocellulose, mono- and di-nitrates prepared at the Seattle Technological Laboratory of the U.S. Bureau of Commercial Fisheries have been found to be highly stable at elevated temperatures. These nitrates have been prepared from various fish oil fatty acid methyl esters and their derivatives.

These mono- and di-nitrates may show promise as oil and grease additives, as intermediates in the preparation of surfactants and germicides, and for controlling the flash-point of fuels, because of their stability and reactivity under certain conditions.



Fur Seals

PRICES FOR ALASKA SKINS AT SPRING 1963 AUCTION SET ANOTHER RECORD:

The spring auction in 1963 (April 25-26) of United States Government-owned fur seal skins yielded close to \$2.95 million. The average price per skin received for male fur seal skins (Black, Kitovi, and Matara) was \$122.52 a new record price. This average price compared with an average of \$107.53 paid at the fall 1962 auction, and was also much higher than the \$106.42 average for skins sold in the spring 1962 auction. However, the average price received for Lakoda or female sheared seal skins was \$43.09 or much lower than the average of \$48.40 received at the fall 1962 auction and slightly lower than the average of \$44.33 received at the spring 1962 auction.

Average prices per skin received for processed male fur seal skins at the spring 1963 auction were (average for fall auction in parentheses): Black, \$125.87 (\$115.99); Kitovi,

\$116.81 (\$105.81); Matara, \$121.01 (\$99.04). Prices received at the spring 1963 auction for Japanese-owned fur seal skins as compared with the fall 1962 auction were: Black, \$130.29 (\$121.41); Kitovi, \$116.62 (\$98.10); Matara, \$123.44 (\$100.75). Prices for South African fur seal skins at the spring 1963 auction were: Black, \$73.97; Deep Blue, \$62.28; and Neutral, \$72.20.

Fur seal skins sold in the April 1963 auction amounted to 21,694 conventionally processed male skins and 6,676 Lakoda or sheared female skins.

Note: See Commercial Fisheries Review, January 1963 p. 28 and July 1962 p. 19.



Great Lakes

PUBLIC HEARING ON RESULTS OF STUDIES IN LAKE SUPERIOR:

The results of studies in Lake Superior since its waters were closed to commercial lake trout fishing in June 1962 were discussed at a public hearing in Houghton, Mich., on May 21, 1963, which was scheduled by the Michigan State Conservation Department.

The latest findings on lamprey predation, lake trout stocks and their natural reproduction, and other developments in Lake Superior were outlined by representatives of the Michigan Conservation Department, the U. S. Bureau of Commercial Fisheries, and the Great Lakes Fishery Commission.



Groundfish

FORECAST OF ABUNDANCE ON NEW ENGLAND FISHING BANKS IN 1963:

There will not be too much change in the abundance of groundfish on New England fishing banks during 1963, according to a forecast issued by the Atlantic States Marine Fisheries Commission. The Commission predicts that the cod supply will be at least as good as in each of the previous two years. Haddock abundance on Georges Bank may decline toward the end of 1963. There are indications that both the 1960 and 1961 haddock year-classes are not as strong as the 1958 age group.

The Commission states that no significant change was expected in ocean perch abun-

dance from the previous two years. In the whiting fishery, a large supply of 1961 yearling fish should enter the fishery in 1963. This should provide a supply equal to or greater than that in 1961.



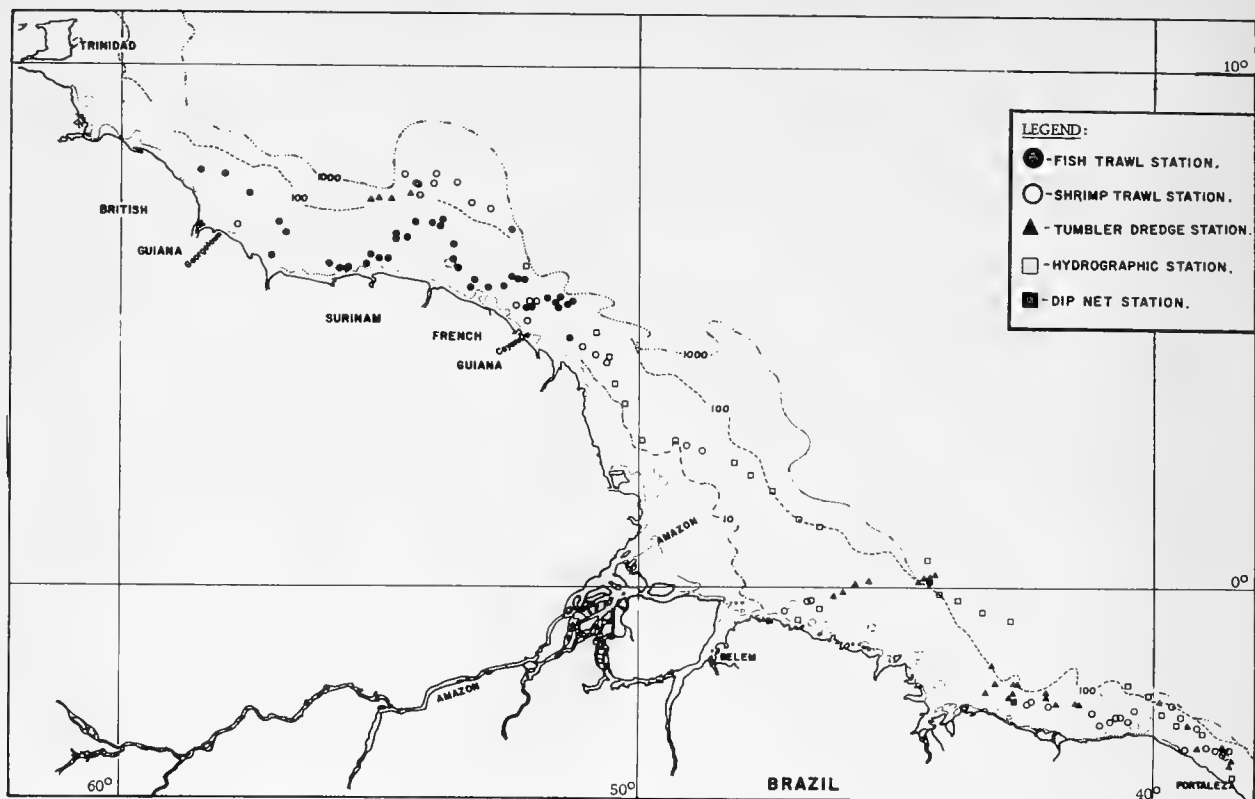
Gulf Exploratory Fishery Program

NORTHEAST COAST OF SOUTH AMERICA SURVEYED FOR SHRIMP AND BOTTOMFISH:

M/V "Oregon" Cruise 84 (February 5-April 6, 1963): Objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Oregon were to: (1) make a preliminary assessment of the distribution and availability to bottom trawls of the food fishes of the Continental Shelf off the northeast coast of South America; (2) extend shrimp explorations southeast of the Amazon River to longitude 40° W., and on to the Continental Slope along the Guianas; and (3) observe the occurrence of surface schooling tunas in the Gulf of Mexico, the Caribbean Sea, and off northeastern South America. In addition, the vessel participated in the International Cooperative Investigation of the Tropical Atlantic (ICITA).

During the first half of the cruise (February 5-March 2), spring season exploratory coverage was obtained of the shrimp resource on the shelf off the Guianas using 2-inch stretched-mesh trawls. Previous explorations in the area (Cruise Nos. 47 and 53) had been made in the fall of 1962. Two areas of commercial pink and brown shrimp potential were located--one off Devils Island, French Guiana, and one off Cabo Orange on the French Guiana-Brazil border. Neither area had been fished by the growing fleet of United States shrimp vessels operating out of Guiana ports. Reports of catches, which ranged from 30 to 70 pounds of 15-count per pound headless shrimp per hour drag, were relayed to the fishing fleet by radio.

Groundfish operations with roller trawls on rough and broken bottom were precluded by the heavy seas created by the spring trade-winds and the exposed nature of the area. Smoother bottom, well suited to trawling, appears to prevail generally inside 60 fathoms, and 49 fish-trawl drags completed on this bottom took small lane snapper (Lutjanus synagris) in amounts ranging from 5 to 20 pounds per hour. Between 40 and 60 fathoms, small red and vermilion snapper (Lutjanus

R/V Oregon Cruise 84, February 5 to April 6, 1963.

aya and *Rhomboplites aureorubens*) were also taken in small numbers. The broken bottom areas immediately adjacent to the 40-60 fathom interval on the shelf edge appears to be promising for roller-rigged trawl fishing in summer and fall when sea conditions are better. Those areas have supported snapper handline fisheries in the past.

Largest fish catches between Georgetown, British Guiana, and Cayenne, French Guiana, were confined to waters shallower than 20 fathoms, where drags with a 65-foot high-opening roller-rigged fish trawl, yielded from 800 to 1,500 pounds of fish per hour. Predominant in the catches were large sea trouts (*Cynoscion* sp.) and croakers (*Micropogon* sp.), groupers (*Haemulon* sp.), and several species of catfishes. Seabobs (*Xiphopneus kroyeri*), occurred in those catches in amounts ranging from 150 to 300 pounds per hour, and were concentrated out to depths of 35 fathoms between Cayenne and Cabo Orange.

The high resolution white-line fish finder was monitored constantly but only one large midwater fish school was observed, north-

east of Cayenne. Sampling showed that school to be composed of juvenile anchovies and thread herring.

Emphasis during the second half of the cruise was on exploring the shelf south of the Amazon River mouth. Between the Amazon and Fortaleza, Brazil, 35 shrimp trawl and 33 dredge hauls were made, generally in depths of 10-40 fathoms. Beyond the 40-fathom curve a steep escarpment falls directly to 1,000 or more fathoms. Catches of shrimp were small, and both brown and white shrimp were present in half of the drags made inside 25 fathoms. East of Parnaiba, drags made on shell bottom caught from 1 to 4 spiny lobsters, and one drag yielded 49 lobsters. Since part of the exploratory fishing activity was conducted adjacent to the recently controversial Brazilian lobster grounds, a Brazilian Naval Officer was assigned to the Oregon for liaison and as official observer.

Nine drags were made in 300-500 fathoms off French Guiana and Surinam where previous Oregon surveys had resulted in small catches of the scarlet shrimp *Plesiopenaeus*

edwardsianus. Heavy seas prevented adequate fishing trials. Catches ranged from 15 to 20 pounds of the shrimp per hour. The largest haul produced 80 pounds of 3-10 count (per pound heads-on) scarlet shrimp in a 4-hour drag with a 40-foot flat trawl. These results indicate that a combination of the use of high-opening trawls and intensive exploratory fishing in that area may prove the existence of commercially valuable concentrations. This species is being fished commercially off Spain and marketed in the eastern United States. Of particular interest in trawling at these depths was the capture of from one to nine Atlantic king crabs (*Lithodes* sp.) ranging in size from juveniles to 8-10 pounds each.

Forty plankton tows, 69 bathythermograph casts, 104 sea surface radiation temperature observations, and 13 water samples (sediment transport) from the Amazon drainage were obtained throughout the cruise as participants from the University of Miami Laboratory conducted selective faunal sampling during both sections of the cruise for the ICITA project.

Port calls were made at Port of Spain, Trinidad; Cayenne, French Guiana; Belem, Brazil; Fortaleza, Brazil; and Georgetown, British Guiana. Talks with United States shrimp producers and fishermen at many of these ports reveal that there are from 40 to 50 United States shrimp trawlers working out of Georgetown and indicate that the fleet now working the Guiana shrimp grounds ranges from 100 to 150 vessels.



Gulf Fishery Investigations

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during January-March 1963:

SHRIMP FISHERY PROGRAM: Shrimp Spawning Populations: Ovary studies were made on brown shrimp taken from an area between Freeport, Tex., and Cameron, La., during July-December 1962. The shrimp were taken at 15 and 25 fathoms. Females in a spawning or recently-spent condition averaged 20-25 percent of the total sample from both depth zones. In general, the ovary conditions noted in brown shrimp in the same area during 1961 agree with the observations of ovary conditions made in 1962.

Shrimp Larval Studies: A total of 150 plankton samples collected in August, September, and October 1962

were examined for penaeid larvae. The relative abundance of larvae in all statistical areas was greater than at any previous period in 1962. This was thought to be a general indication of increased spawning activity. Larval abundance was consistently greater in statistical areas 17-21 than in areas 13-16, with the exception of area 13 in August. Most larvae were taken at the 25-fathom stations, although the increase in abundance was noted at all depth zones.

The larvae caught during the period primarily represented non-commercial species (*Trachypeneus*, *Sicyonia*, *Solenocera*, and *Parapenaeus*). *Penaeus* larvae, although comparatively fewer in number, also exhibited greater abundance than in the preceding seasons.

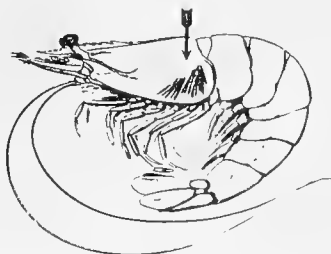
Shrimp Postlarval Studies: Additional monitoring stations for the collection of postlarval shrimp were established during the quarter. Samples are now obtained routinely with standard collecting gear at Port Isabel, Aransas Pass, and Sabine Pass (Tex.); Caminada Pass (La.); Bay St. Louis (Miss.); and Mullet Key, Tampa Bay, (Fla.). The postlarval monitoring stations will provide data that will be used to assess the reliability of derived measures of postlarval abundance which show promise in forecasting shrimp-fishing conditions along the northern Gulf coast.

Bait Shrimp Fishery: The estimated commercial bait shrimp catch in Galveston Bay in 1962 amounted to a record 1,062,900 pounds, up 45 percent from the amount taken in 1961 for bait purposes. In the first 2 months of 1963, bait shrimp production was 76 percent greater than in the same period of the previous

STAINED SHRIMP 50¢ REWARD

Shrimp have been marked with blue, green and red biological stains — in order to obtain information on migrations and growth. The color appears only on both sides of the head (in the gills) as shown in the illustration.

Look for color here



A reward of 50¢ will be paid for stained shrimp when returned with the following information:

1. Exact place the shrimp was caught.
2. Date the shrimp was caught.

NOTIFY BY MAIL THE U. S. FISH AND WILDLIFE SERVICE, BIOLOGICAL LABORATORY, P.O. BOX 3098, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE SERVICE AGENT OR REPRESENTATIVE

Stained shrimp must be verified by Fish and Wildlife Service biologist before payment. The stains used are approved for this use by the Food and Drug Administration.

Fig. 1 - Reward poster for return of stained shrimp.

year. Bait shrimp fishing slowed considerably in February 1963 due to unusually cold weather. Incomplete reports indicated that juvenile white shrimp were taken in considerable quantities in March 1963.

Migrations, Growth, and Mortality of Brown and White Shrimp: Of the 2,431 stained and 1,690 tagged brown shrimp released off the Texas coast in April 1962, 153 (6.3 percent) stained and 87 (5.2 percent) tagged individuals had been recovered by the end of the first quarter of 1963. Three stained shrimp were recaptured that had been at liberty more than 8½ months. The returns indicated that the adult brown shrimp under study did not move great distances. Their movement was random, and they comprised a single population.

Two mark-recapture experiments with white shrimp started during September 1962 involve 1,905 stained shrimp released west of Vermilion Bay, La., and 2,291 stained shrimp released off Cameron, La.

As of mid-March 1963, 200 (9 percent) of the marked shrimp from the Cameron study had been recovered, and 75 (4 percent) had been returned from the Vermilion Bay experiment. For the period indicated, it appears that movement of the species was restricted, and only one population was involved. Weight-at-age data suggest that white shrimp during the fall increase in size from 120 millimeters (50-count) to about 135 millimeters (35-count) in 2 weeks, and to 160 millimeters (20-count) in 8 weeks.

Several groups of shrimp were stained first with a fast green dye to provide a primary mark, and then treated with various fluorescent pigments to determine the longevity of the materials as secondary marks. After 100 days, the fluorescent marks were as vivid as when they were first injected into the shrimp. Initial mortality occurred within 24 hours after marking and was attributed to handling and not to any effects of the fluorescent material. Omitting the initial mortality, it appears that the fluorescent pigments have no long-term adverse effect on survival.

Migrations, Growth, and Mortality of Pink Shrimp: In August and September 1962, a total of 19,860 small pink shrimp were stained and released at Indian Key, Fla., which lies about midway between the Sanibel and Tortugas fishing grounds. By the end of the first quarter of 1963, a total of 36 representatives of that group had been returned--26 were recovered on the Sanibel grounds and 10 on the Tortugas grounds. The distribution of recoveries suggests that the shrimp on both fishing grounds represent the same population. Shrimp which occupy the interlying area are not accessible because of untrawable bottom.

About 33 percent of the 2,350 marked pink shrimp released on the Tortugas grounds in December 1962 had been recovered by the end of March 1963. Preliminary analysis of recovery and associated effort data for the first 7 weeks of the experiment indicates that the monthly rate of fishing mortality was about 29 percent and the monthly loss from all other causes was roughly 48 percent. In an effort to determine the proportion of marked shrimp that might have been overlooked during processing ashore, stained shrimp were planted in selected landings at various packing houses. The shrimp were given an inconspicuous secondary mark for identification purposes. On the average, 25 percent of the planted shrimp were not detected.

Growth per month from an initial length of 133 millimeters was estimated at 4½ millimeters for males



Fig. 2 - Shrimp being stained as part of the investigations on shrimp migrations.

and females combined. The movement of the marked shrimp was generally eastward into deeper water.

Population Dynamics: Commercial fishery statistics were analyzed in order to extend previous statistical studies carried out in 1956-1959 on shrimp densities in the Gulf. It is anticipated that continuous records of this type, summarized at frequent intervals, will provide further insight into relationships between shrimp abundance and major oceanographic events and fishing practices.

Preparations were made for mesh-selection studies designed to provide comparative information on the fishing characteristics of variously constructed (commercial-type) trawling gear, when such gear is viewed from the standpoint of the efficiency with which it samples shrimp populations.

Commercial Catch Sampling: During the first quarter of 1963, agents stationed at Brownsville, Aransas Pass, and Galveston (Tex.); Morgan City and Houma (La.); Pascagoula (Miss.); and St. Petersburg (Fla.), examined 36,600 shrimp samples from the catches of 266 vessels to determine the species, sex, and size composition of commercial shrimp landings.

On the basis of those samples and without regard to differences between areas and species, 70 percent of the total fishing effort was expended, and 72 percent of the vessel catch was made during the hours of darkness. The catch of shrimp per hour's fishing averaged 21 pounds during the day and 23 pounds at night. About 81 percent of the night fishing was for brown and pink shrimp, usually in waters deeper than 10 fathoms. Thirty-five percent of the catch was taken from depths of 10 fathoms or less, 18 percent from 10-20 fathoms, and 46 percent from waters deeper than 20 fathoms.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: At the beginning of the quarter, a revised scheme of sampling the Galveston Bay estuarine system was initiated. The system is now divided into 9 sub-areas, each characterized by 2 to 5 habitat types. Sixty-five separate locations are sampled semimonthly for hydrological data and biological material (table 1). Sup-

plementary data are provided from an additional 36 stations established by the U. S. Corps of Engineers

Subarea	No. of Stations	Habitat Type				
		Channel	Open Water	Shore-line	Bayou	Special
Gulf of Mexico	2	1/1	1	-	-	-
Tidal Pass	4	1/2	2	-	-	-
Lower Galveston Bay	14	1/2	4	4	2	2/2
Upper Galveston Bay	10	1/2	4	2	2	-
Mouth of San Jacinto River	5	1/1	2	2	2	-
Trinity Bay	14	1	5	6	2	-
East Bay	14	1	4	6	2	2/1
Intracoastal Waterway	2	2	-	-	-	-
System Total	65	12	22	20	8	3
1/Houston Ship Channel.						
2/Stations at which only hydrological measurements are being taken.						

Biological populations being sampled for density (or abundance) measurements include those of various fishes, crustaceans (particularly shrimp and crabs), and certain molluscs. All life history stages, larvae through adult, are receiving attention. Observations or measurements of hydrological factors include those of water temperature, salinity, turbidity, water circulation and elevation, tidal stage, and bottom composition. In addition, detailed analyses of water quality at sampling locations will be conducted by the Texas Water Pollution Control Board.

Both hydrological and biological data are being tabulated for each station and then combined for analysis of conditions within specific subareas and habitat types, or any combination of subareas and habitat types, on the basis of 2-week, 2-month, 3-month, seasonal, and annual increments of time.

Preliminary analysis of hydrological data for the first quarter of 1963 has been completed. Table 2 illustrates the temperature and salinity gradients between

Subarea	No. of Stations	Salinity (‰)			Temperature (°C.)		
		Avg.	Min.	Max.	Avg.	Min.	Max.
Gulf of Mexico	2	31.6	29.1	34.2	12.6	8.7	18.5
Tidal Pass	4	26.5	18.4	31.9	13.0	9.6	20.5
Lower Galveston Bay	14	21.1	13.3	28.0	12.5	0.4	23.9
Upper Galveston Bay	10	15.8	9.8	20.1	12.1	3.2	21.1
Mouth of San Jacinto River	5	14.8	8.8	19.3	13.3	5.7	21.3
Trinity Bay	14	9.9	0.4	16.6	11.7	3.6	19.2
1/Preliminary.							

the Gulf of Mexico and Trinity Bay. The salinity gradient held for both minimum and maximum salinity conditions. As expected, the greatest variation occurred in Trinity Bay, nearest the source of fresh water, and lower Galveston Bay, nearest the source of salt water.

Considerable temperature variation occurred throughout the system. Extremely low water temperatures were recorded in both January and February when values as low as 0.4° C. were obtained in the open, shallow waters of lower Galveston Bay. During the same period, the bottom temperature in the deeper water of the Houston Ship Channel reached a low of 6.6° C. Due to their short duration, the low temperature levels did not cause any extensive fish kills in the Galveston Bay system. Most species of fish and crustaceans were temporarily stunned, however, and readily captured by sampling gear.

Preliminary analysis of the first quarter's hydrological data indicates that the Houston Ship Channel

effectively separates the east and west portions of lower and upper Galveston Bay, as well as the area at the mouth of the San Jacinto River. Salinity differences of as much as 7‰ occurred in open bay water adjacent to either side of the channel. Treatment and analysis of both hydrological and biological data will necessarily take into account this artificial division.

Effects of Engineering Projects: During the quarter, 57 appraisals were made of engineering and mineral development projects potentially affecting fishery resources in Texas coastal waters. The majority resulted from the 104 Corps of Engineers public notices and letters received during the quarter. As directed by the present system of coordination, the results of the appraisals were sent to the Branch of River Basin Studies, U. S. Fish and Wildlife Service, and the Texas Game and Fish Commission. Sections pertaining to coastal fishery resources in 21 U. S. Bureau of Sport Fisheries and Wildlife draft reports on water development projects were received for review.

Most of the Corps of Engineers public notices dealt with Department of the Army private permits for mineral development, channel dredging or bulkheading, and filling. Such projects frequently require modification to minimize possible damage to the estuarine environment and its dependent fishery resources. When this is the case, recommendations for corrective action are sent to the Branch of River Basin Studies, which in turn requests the Corps of Engineers to require the applicant to modify the original plans. When oyster leases or extremely valuable estuarine habitat may be involved, the Corps is requested to have the applicant obtain approval from the Texas Game and Fish Commission before initiating the proposed project.

Considerable attention was given to two projects which may have extremely adverse effects upon the estuarine environment. They are the Matagorda Bay Ship Channel and Texas Basins Projects.

The Matagorda Ship Channel Project, now under way, provides for the enlargement and partial relocation of the channel itself. Model tests indicate a possible increase in bay salinity due to the greater size of the channel and the planned distribution of spoil in the lower bay. Should the salinity increase be unacceptable, remedial action would be required. Possible solutions are being studied.

The Texas Basins Project includes a proposal for numerous upland reservoirs and a water transport canal to divert the flow from major streams in east Texas to west Texas. Such a project would reduce the tributary inflow into most Texas estuarine systems. During drought years, this reduction could be critical, particularly in view of other water demands which are expected in the future. Thus, the Texas Basins Project would compound an already critical problem. The review of the project disclosed the need to establish preliminary average and minimum flow requirements for all major estuarine systems in the State, except Laguna Madre which the project would not affect.

INDUSTRIAL FISHERY PROGRAM: **Commercial Catch Sampling:** Excluding menhaden, the industrial fish catch in 1962 rose 27 percent to a record of nearly 50,000 tons. Approximately 875 more fishing trips in 1962 than in the previous year accounted for the larger

catch. The catch per fishing hour in 1962 approached 0.6 tons which was almost the same as in 1961. The Atlantic croaker continued to constitute roughly 58 percent of the total catch. Spot accounted for 9 percent of the catch in 1962; the sand seatrout, 6 percent, and the Atlantic cutlassfish, 5 percent.

A gross analysis of four years of industrial fishery catch and effort statistics was completed. The data revealed that the relative abundance of each of the major species (using the catch per hour as an index) remained about the same, whereas fishing effort increased measurably. Continued surveillance of the fishery will reveal whether or not the increasing fishing intensity has begun to adversely affect the resource potential.

Commercial landings continued to be sampled for biological material which is needed to complete life history studies on the major species, particularly the Atlantic croaker, supporting the industrial bottomfish fishery.

Distribution and Abundance of Western Gulf Bottomfishes: Quantitative and qualitative processing of fish samples collected on survey cruises conducted under the Shrimp Fishery Program during 1962 was resumed.

Area and Depth (fms.)	Catch in Pounds per Hour of Fishing ^{1/}					Year 1962
	Jan.-Mar.	Apr.-June	July-Sept.	Oct.-Dec.		
<u>Off Texas (San Luis Pass to Brazos Santiago):</u>						
7 $\frac{1}{2}$	20	60	100	95	70	
15 $\frac{1}{2}$	50	25	40	135	65	
25	105	70	85	165	110	
35	75	95	70	150	100	
45	110	90	80	145	110	
60	105	75	65	105	90	
<u>Off Louisiana (Calcasieu Pass to Southwest Pass):</u>						
7 $\frac{1}{2}$	190	270	585	2/670	385	
15 $\frac{1}{2}$	275	190	380	415	305	
25	250	135	175	320	220	
35	155	120	170	250	170	
45	160	80	120	135	130	
60	105	95	70	50	80	

1/Trawling with 45-foot (flat), 2-inch mesh trawl with rollers.
2/Less than 10 hours' effort.

^{1/} Trawling with 45-foot (flat), 2-inch mesh trawl with rollers.

^{2/} Less than 10 hours' effort.

A preliminary analysis of the total catch (all species combined) shows that in waters of less than 40 fathoms, there was a much higher average catch of bottomfish off Louisiana than off Texas (table 3). The catch per unit of effort in the shallowest waters sampled (7 $\frac{1}{2}$ fathoms) was more than five times greater off Louisiana.

At the start of 1963, the sample collecting methods were revised to improve the preservation of sample material and to increase the size of each sample. Many fish specimens are being retained for a reference collection and display.

BEHAVIOR PROGRAM: Tolerances: Completion of 4 constant-temperature rooms and acquisition of additional laboratory space permitted the first large-scale study of the combined influence of salinity and temperature on the survival of postlarval shrimp. Seven levels of temperature (3°, 5°, 13°, 21°, 30°, 35°, and 43° C.) and eight levels of salinity (2‰, 5‰, 10‰, 18‰, 25‰, 35‰, 40‰, and 45‰) were tested in the 56 possible combinations. Each 2-factor combination was evaluated in terms of the survival of 30 postlarvae (probably *Penaeus aztecus*) exposed to the experimental condition for 24 hours. Each of the 1,680

experimental shrimp was enclosed in a small cage which prevented the specimen from jumping out of the water or becoming a victim of cannibalism. The shrimp were introduced directly into the experimental salinity-temperature conditions without prior acclimation.

The results of the study, which demonstrated no survival at 3° or 43° C. regardless of salinity, support and extend the evidence from previous work. The over-all range of salinity-temperature conditions in which 100 percent survival was obtained proved somewhat narrower than that observed in past studies. Since the earlier work involved acclimation periods of about eight hours during which the experimental subjects were gradually brought from holding-tank conditions to the levels to be tested, the difference between the previous and present results may be due to the influence of acclimation.

Preliminary observations indicate that the Atlantic croaker (*Micropogon undulatus*) can be studied successfully in a vertical salinity gradient. After a few minutes of active efforts to escape the equipment, the fish become much quieter and exhibits a very definite zone of preference. This work will be continued.

Growth and Metabolism: An experiment testing the effects of both temperature and salinity on the growth of postlarval shrimp was begun. Five levels of salinity (2‰, 5‰, 15‰, 25‰, and 35‰) are being tested at each of four levels of temperature (11°, 18°, 25°, and 32° C.). Each experiment starts with 100 postlarvae.

During the quarter, results with postlarvae tentatively identified as *Penaeus aztecus* showed that at the highest temperature level (32° C. or 89.6° F.), mortality during adjustment of the test medium began when the salinity level reached 15‰ and continued as the level was further reduced to 5‰ and 2‰. Mortality after 5 days was 15 percent at 15‰, 25 percent at 5‰, and 45 percent at 2‰.

At the lowest test temperature level (11° C. or 51.8° F.), no mortality occurred until the salinity reached 2‰. But at that point, 75 percent of the specimens died within the first 24-hour period, while an additional 20 percent died with the second 24-hour period. In a 5‰ medium at the same temperature, a mortality of only 5 percent was observed during the same 48-hour period. The effect of low salinity was evident even at 18° C. (64.4° F.), at which 15 percent of the specimens died during the 48 hours following adjustment to 2‰.

The data indicate that high salinity levels (within the range of those tested) are better tolerated by postlarval shrimp at all temperatures than are very low salinity levels.

Marked differences in growth and food intake were noticeable even after 5 days. Specimens at intermediate salinity levels (5‰-25‰) and 32° C. had doubled their weight, whereas those at the extreme salinity levels (2‰ and 35‰), and all animals at 25° C. (77.0° F.), had increased their weight by 60-70 percent. Specimens tested at 18° C., however, had weight gains averaging only 30 percent, and those at 11° C., only 10 percent. The rate of growth is a direct reflection of the amount of food consumed. Specimens at 32° C. ingested 10

times the quantity of food taken by those at 11° C., and 4 times that consumed by specimens tested at 18° C.

SPECIAL REPORTS: Chemistry and Sea-Water Laboratory Services: Considerable time was spent testing the two N-ethyl carbazole methods for determining carbohydrate levels. The results of preliminary tests indicated that the older of the two methods gives considerably higher results. The difference between the methods, which is on the order of several magnitudes, might be the factor responsible for the conflicting conclusions of investigators who have attempted to correlate carbohydrate concentrations with various biological activities.

Additional work was done on the ammonia stabilization experiments which were started in 1962. Thus far, indications are that the ammonia content in samples of marine and estuarine water can be stabilized for many months by refrigeration.

Preliminary investigation of two methods of determining nitrite concentration indicated a serious lack of agreement. This disagreement, together with the divergent carbohydrate techniques mentioned above, suggests the possibility that some methods of seawater analysis are not necessarily applicable when assaying samples from coastal or estuarine environments.

Control of Harmful Organisms: This project involves the development of chemical methods for the control of the red-tide organism, *Gymnodinium breve*. The study was expanded by adding a phase which entails evaluating the effects of the seven most selectively toxic chemicals on test cultures in Florida coastal water. Samples of Florida water from areas frequented by the red tide organism were received, and testing was scheduled to begin as soon as suitable cultures could be established.

CONTRACT RESEARCH: Life History of Late Postlarval and Juvenile Shrimp in the Everglades National Park Nursery Grounds: The special sampling net used in the Buttonwood Canal at Flamingo, Fla., was modified, and a second net has been built to correct difficulties in the fishing operation.

Ten sampling periods were completed in January-March 1963, during which 104 samples were taken. Several relationships between shrimp abundance and variation in the environment began to appear. The mean numbers of juvenile shrimp caught on flooding currents were low compared to the numbers caught on ebbing currents. No shrimp were caught during full daylight. Temperature data, although sparse, indicated a relationship between low temperatures and large migrations out of the nursery area. The modal size of the sampled shrimp did not change greatly during the sampling period under consideration.

Abundance and Distribution of Larvae of the Pink Shrimp on the Tortugas Shelf of Florida: Three plankton collecting trips to the Tortugas shelf and eight to Buttonwood Canal near Flamingo, Fla., were made during the quarter. Pink shrimp larvae were scarce, which was to be expected during the winter season. A new device for positioning plankton nets at specified depths, the acoustical depth indicator, was successfully tested.

A report on the distribution of pink shrimp larvae in the waters of the Tortugas shelf between 1959 and 1962 was completed.



Fig. 3 - Pink shrimp, *Penaeus duorarum*.

Abundance of Postlarval Shrimp in Mississippi Sound and Adjacent Waters: Additional sampling stations were selected during the quarter, bringing the total to 16 as of the end of February. The average sample catch of brown shrimp postlarvae gradually increased from less than 1 in January and February to nearly 6 in March. Considerable variability in numbers of postlarvae was noted between stations. Net hauls at most barrier island stations, for instance, produced no postlarvae.

Postlarval Populations of White Shrimp and Brown Shrimp with Respect to Season and Area in Vermilion Bay, La: This research was not activated until mid-February 1963. Progress was made on ordering and modifying equipment. A total of 6 of the proposed 8 sampling stations in Vermilion Bay were established. At three of those stations, samples were taken regularly. Thus far, large numbers of mysid shrimp larvae, grass shrimp, and some postlarval penaeid shrimp have been collected. The penaeids have all been identified as brown shrimp.

Seasonal Distribution Patterns of Adult and Larval Shrimp in Aransas Pass (Tex.) Inlet: This contract was awarded in early March 1963. The research will be conducted by the University of Texas Institute of Marine Science at Port Aransas, Tex.

Note: See *Commercial Fisheries Review*, February 1963 p. 32.

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SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-3 (March 26-April 7, 1963): Catches were moderate during

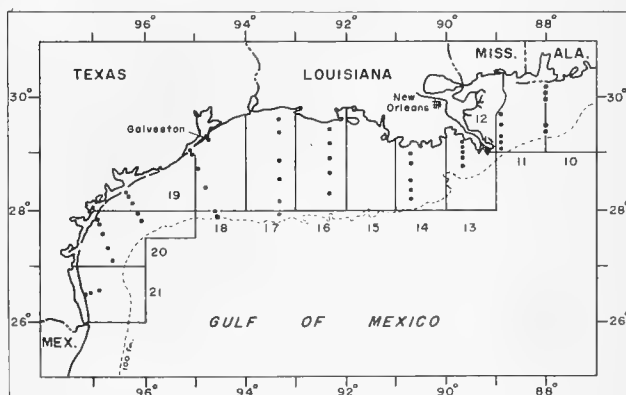


Fig. 1 - Shows the station pattern for the shrimp distribution studies in the Gulf of Mexico during 1963.

this cruise off the coast of Louisiana and Texas by the chartered vessel Gus III. The



Fig. 2 - A Gulf V plankton sampler being hauled aboard after a shrimp larvae sampling tow has been completed.

vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico.

Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered. Weather was good throughout the cruise and one 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-10, 10-20, and over 20 fathoms) in all areas. Large brown shrimp predominated in the catch from all areas, except area 21.

The best catches during this cruise were made in the over 20-fathom depth off the Louisiana coast. Area 13 yielded 16 pounds of 15-20 count brown shrimp from over 20 fathoms, 9 pounds of 15-20 count white shrimp from the 10-20 fathom depth, and 3 pounds of 21-25 count white shrimp from less than 10 fathoms.



Fig. 3 - Removing the sample cup from a Gulf V plankton sampler.

In area 14, a catch of 16 pounds of 12-15 count brown shrimp was made in over 20 fathoms, and 2 pounds of 21-25 count white shrimp were taken in the under 10-fathom depth.

The tows in area 16 yielded 9 pounds of 12-15 count brown shrimp from the over 20-fathom depth, 3 pounds of 15-20 count brown shrimp from the 10-20 fathom range, and 1 pound of 21-25 count white shrimp from the less than 10-fathom depth.

Area 17 yielded 24 pounds of 12-15 count brown shrimp from over 20 fathoms, and 3 pounds of 21-25 count white shrimp from under 10 fathoms.

Off the Texas coast, the best catch consisted of 24 pounds of 15-20 count brown shrimp from the 10-20 fathom range in area 19. The area also yielded 1 pound of 31-40 count brown shrimp and 4 pounds of 21-25

count white shrimp from the under 10-fathom depth.

In area 21 (off Brownsville, Tex.), the catch from under 10 fathoms consisted of 10 pounds of 26-30 count white shrimp and 3 pounds of 26-30 count pink shrimp. In the same area, 3 pounds of 15-20 count brown shrimp were taken in the 10-20 fathom range.

The catch was light in other areas off the Texas coast.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the numbers of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, May 1963 p. 29.



Hawaii

FISH AND SHELLFISH LANDINGS, 1961-1962:

Commercial landings of fish and shellfish in the State of Hawaii were down 9.0 percent in quantity and 2.7 percent in value from those in 1961. The decline was due mainly to a drop in the catch of skipjack tuna which makes up the bulk of the Hawaiian landings.

The Island of Oahu was the State's leading fishery center in 1962 with a total catch of 10,144,580 pounds. The Island of Hawaii was in second place with a catch of 1,567,198 pounds, followed by the Island of Maui with a catch of 1,210,191 pounds. The remainder of the catch was landed at ports on the Islands of Lanai, Kauai, and Molokai. (Hawaiian Department of Land and Natural Resources, Honolulu, April 9, 1963.)

Hawaiian Commercial Fishery Landings and Ex-Vessel Value, 1961-1962				
Species	1962		1961	
	Quantity 1,000 Lbs.	Value \$1,000	Quantity 1,000 Lbs.	Value \$1,000
Tuna and Tunalike Fish:				
Albacore	16.7	4.0	13.6	4.1
Big-Eyed	1,220.8	598.1	1,037.4	507.6
Yellowfin	396.8	143.0	459.0	168.4
Skipjack	9,415.4	1,174.0	10,951.3	1,306.7
Bonito or little tuna	13.3	2.4	2.0	0.4
Total tuna and tunalike fish	11,063.0	1,921.5	12,463.3	1,987.2
Other fish and shellfish	2,106.7	897.8	2,008.5	909.8
Grand Total	13,169.7	2,819.3	14,471.8	2,897.0

Note: See Commercial Fisheries Review, May 1963 p. 30 and January 1963 p. 33.

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SKIPJACK TUNA LANDINGS, JANUARY-MARCH 1963:

Skipjack tuna landings in Hawaii during March 1963 were about 170,000 pounds or 110,000 pounds below the 1948-1962 average landings for the month. Individual vessel catches per trip ranged from 77 pounds to 6,681 pounds. Most of the fish taken were caught during the first 2 weeks of March.

Cannery records of weight composition showed that 11 percent of the skipjack landed during March 1963 were small, 43 percent were small-medium, 27 percent were medium, and 19 percent were large. A night-sampling program has been undertaken by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu to collect length frequencies from tuna which are sold on the fresh fish market and are therefore not available for cannery measurements.

Total estimated landings of skipjack tuna in January-March 1963 amounted to 800,000 pounds, which was 40,000 pounds above the average first quarter landings during 1948-1962.



Industrial Fishery Products

U. S. PRODUCTION, 1962:

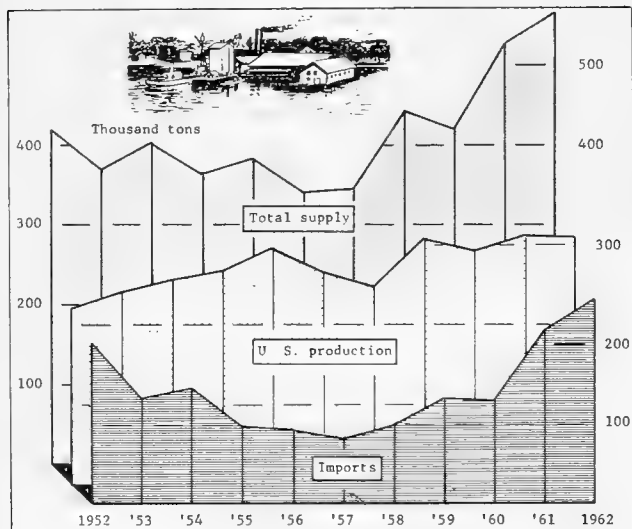
The production of industrial fishery products by 158 plants in the United States, American Samoa, and Puerto Rico in 1962 was valued at \$75.4 million--an increase of \$869,000 compared with 1961.

Production of meal and scrap (311,000 tons) remained at nearly the same level as in 1961. Menhaden meal accounted for 77 percent of the total. Production of meal would have exceeded the 1961 record by several thousand tons if bad weather had not caused an abrupt termination of the fall menhaden fishery in North Carolina.

Over 33 million gallons of marine animal oil were produced in 1962--a decrease of 1.4 million gallons, compared with 1961. Menhaden oil (30.7 million gallons) accounted for 93 percent of the total.

Although production of solubles and homogenized condensed fish increased from 112,000 tons in 1961, to 124,000 tons in 1962, produc-

was well below the 165,000 tons in 1959. Some solubles were incorporated into fish meal rather than being sold separately.



United States supply of fish meal, 1952-62.

Products from oyster shells and buttons from fresh-water and marine mollusk shells were valued at \$8.6 million in 1962--a decrease of \$805,000, compared with the previous year. Other industrial products manufactured included agar-agar, fish-feed pellets and animal feeds, glue, Irish moss extract, kelp products, liquid fertilizer, mollusk-shell lime, pearl essence, and crab shells valued at \$13.4 million.

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-February 1963: Based on domestic production and imports, the United States available supply of fish meal for January-February 1963 amounted to 63,713 short tons--14,669 tons (or 29.9 percent) more than during the same period in 1962. Domestic production was 334 tons (or 7.0 percent) more, and imports were 14,335 tons (or 32.4 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 46,631 tons.

The United States supply of fish solubles (including homogenized fish) during January-February 1963 amounted to

U. S. Supply of Fish Meal and Solubles, January-February 1963 with Comparisons			
Item	Jan.-Feb.		Total 1962
	1/1963	1962	
	. . . . (Short Tons)		
<u>Fish Meal and Scrap:</u>			
<u>Domestic production:</u>			
Menhaden	-	2/	243,839
Tuna and mackerel	3,930	2,928	20,874
Herring	-	2/	3,543
Other	1,202	1,870	41,744
Total production	5,132	4,798	310,000

(Table continued on opposite column)

Item	Jan.-Feb.		Total 1962
	1/1963	1962	
..... (Short Tons)			
<u>Imports:</u>			
Canada	5,794	5,757	42,806
Peru	46,631	35,231	186,249
Chile	3,800	1,157	9,247
Angola	575	-	-
So. Africa Republic	1,450	2,000	10,084
Other countries	331	101	3,921
Total imports	58,581	44,246	252,307
Available fish meal supply	63,713	49,044	562,307
<u>Fish Solubles:</u>			
Domestic production <u>3/</u>	2,664	3,203	123,415
<u>Imports:</u>			
Canada	212	208	1,335
So. Africa Republic	-	-	1,717
Other countries	105	2,314	3,256
Total imports	317	2,522	6,308
Available fish solubles supply ..	2,981	5,725	129,723
1/Preliminary.			
2/Included with "other."			
3/50-percent solids. Includes production of homogenized condensed fish.			

1/Preliminary.

2/Included with "other."

3/50-percent solids. Includes production of homogenized condensed fish.

2,981 tons--a decrease of 2,744 tons as compared with the same period in 1962. Domestic production and imports dropped 16.8 percent and 87.4 percent, respectively.

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, February 1963: During February 1963 a total of 2,847 tons of fish meal and scrap and 324,000 pounds of marine-

Table 1 - U. S. Production of Fish Meal, Oil, and Solubles, February 1963 1/with Comparisons					
Product	February		Jan.-Feb.		Total
	1/1963	1962	1/1963	1962	
..... (Short Tons)					
Fish Meal and Scrap:					
Herring	-	-	2/	2/	3,543
Menhaden 3/					243,839
Sardine, Pacific	3	234	9	689	743
Tuna and mackerel	2,222	1,287	3,930	2,928	20,874
Unclassified	622	545	1,193	1,181	19,337
Total	2,847	2,066	5,132	4,798	288,336
Shellfish, marine-animal meal and scrap ..	4/	4/	4/	4/	64
Grand total meal and scrap	4/	4/	4/	4/	310,000
Fish solubles	1,223	1,476	2,614	3,073	112,764
Homogenized condensed fish	-	90	50	130	10,651
..... (1,000 Pounds)					
Oil, body:					
Herring	-	-	2/	2/	5,165
Menhaden 3/	-	38	-	148	236,751
Sardine, Pacific	254	269	544	562	183
Tuna and mackerel	70	74	204	401	4,820
Other (including whale)					12,279
Total oil	324	381	748	1,111	259,198
1 Preliminary data. 2/Included in "other" or "unclassified." 3/Includes a small quantity of bread herring. 4/Not available on a monthly basis. Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.					

1/Preliminary data.

2/Included in "other" or "unclassified."

3/Includes a small quantity of thread herring.

4/Not available on a monthly basis.

Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

animal oils was produced in the United States. Compared with February 1962, this was an increase of 781 tons or 37.8 percent in meal and scrap production, but a decrease of 57,000 pounds or 15 percent in oil.

Tuna and mackerel meal amounted to 2,222 tons--accounting for 78 percent of the February 1963 meal total. Oil from tuna and

mackerel (254,000 pounds) comprised 78 percent of the February 1963 oil production.

A total of 1,223 tons of fish solubles was produced in February 1963--a decrease of 17 percent as compared with February 1962.

* * * * *

Major Indicators for U. S. Supply, March 1963: United States production of fish oil

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, March 1963					
Item and Period	1963	1962	1961	1960	1959
..... (Short Tons)					
Fish Meal:					
Production 1/:					
May	-	42,374	32,922	17,194	25,312
April	-	6,311	6,179	5,076	6,810
March	2,731	2,495	2,751	2,955	2,122
Jan.-Feb.	5,132	4,798	4,794	4,366	5,223
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tots. .	-	310,000	311,265	290,137	306,551
Imports:					
May	-	25,269	25,116	9,496	16,329
April	-	26,390	19,060	10,397	17,654
March	-	18,528	20,458	18,652	16,719
Jan.-Feb.	58,581	44,246	23,875	16,652	39,163
Jan.-Dec. totals . .	-	252,307	217,845	131,561	132,955
Fish Solubles:					
Production 3/:					
May	-	16,014	13,624	7,191	18,639
April	-	3,766	2,539	2,870	6,987
March	1,958	1,903	2,564	2,462	2,382
Jan.-Feb.	2,664	3,203	3,450	3,509	4,124
Jan.-Dec. totals . .	-	124,334	112,241	98,929	165,359
Imports:					
May	-	265	283	59	4,874
April	-	323	220	134	1,622
March	-	308	135	87	410
Jan.-Feb.	317	2,522	374	2,089	1,965
Jan.-Dec. totals . .	-	6,308	6,739	3,174	26,630
..... (1,000 Pounds) 5/					
Fish Body Oils:					
Production:					
May	-	32,186	33,844	13,705	20,180
April	-	5,054	3,406	1,925	3,379
March	411	328	488	512	326
Jan.-Feb.	748	1,111	761	752	791
Jan.-Dec. prelim. totals 4/	-	257,131	259,400	206,848	189,240
Jan.-Dec. final tots. .	-	255,804	266,670	215,861	193,324
Exports:					
May	-	6,491	3,192	2,427	10,910
April	-	10,270	7,351	5,711	8,373
March	-	19,167	5,644	3,157	4,498
Jan.-Feb.	2,537	22,156	30,905	25,896	14,218
Jan.-Dec. totals . .	-	123,050	122,486	143,659	144,481

1/Does not include crab meat, shrimp, and misc. meals.

2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961, and 93 percent for 1962.

3/Includes homogenized fish.

4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.

5/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Note: Data for 1962 and 1963 are preliminary.

and fish solubles in March 1963 was higher by 25.3 percent and 2.9 percent, respectively, as compared with March 1962. Fish meal production increased by 9.5 percent.



Irradiation Preservation

RADIATION PASTEURIZATION OF KING CRAB MEAT REDUCES BACTERIAL POPULATION:

Basic research on the radiation pasteurization of king crab meat by the U. S. Bureau of Commercial Fisheries Technology Laboratory at Seattle, Wash., is concerned with the effect of package atmospheres upon microbiological growth and shelf-life of irradiated king crab meat. Recent experiments have shown a reduction in bacterial population from 100,000 to 100 per gram by irradiation levels of 200,000-400,000 rads.

With storage at 33° F. the microbiological population remains fairly constant for two weeks and then shows an increase with the most rapid growth in air-packed samples. The yeast population reaches 300,000 per gram in air-packed samples during the first 21 days of 33° F. storage after which yeasts decrease, probably due to the competitive effect of increasing bacteria population. In vacuum-packed samples the increase in yeast was not observed. On unirradiated samples bacteria growth occurred after a few days, and yeasts did not develop beyond 400 per gram, indicating bacteria competition from the start. Over 200 yeast cultures were selected from king crab meat and are being identified.

Note: See Commercial Fisheries Review, February 1963 p. 42.



Maine Sardines

CANNED STOCKS, APRIL 1, 1963:

Canners' stocks of Maine sardines on April 1, 1963, were 654,000 cases greater than those of April 1, 1962, but only 193,000 cases above stocks on hand two years ago on April 1, 1961. Distributors' stocks of canned Maine sardines in 1963 are not entirely comparable to those in pre-



vious years due to a change in statistical estimating procedures.

Canned Maine Sardines--Estimated Wholesale Distributors' and Canners' Stocks, April 1, 1963, with Comparisons				
Type	Unit	4/1/63	4/1/62	4/1/61
Distributors	Actual cases	264,000	148,000	267,000
Canners	Std. cases ¹ / ₄	699,000	45,000	506,000
1/100 3 ³ / ₄ -oz. cans equal one standard case.				

On April 15, 1962, carryover stocks at the canners' level amounted to about 33,000 cases. Adding the 1962 season pack of 2,116,000 cases results in a total supply of 2,149,000 cases as of April 1, 1963--up 89.8 percent from the total supply reported April 1, 1962, but down 7.9 percent from the total supply on April 1, 1961. Shipments between April 15, 1962, and April 1, 1963, amounted to 1,450,000 cases, up 33 percent from shipments of 1,087,000 cases during the comparable period in the previous marketing season.

Note: See Commercial Fisheries Review, April 1963 p. 21.



Michigan

GREAT LAKES LANDINGS DROP SHARPLY IN 1962:

Fish caught commercially from Michigan's Great Lakes waters dropped sharply in 1962. Landings amounted to about 22 million pounds and were valued at about \$2,495,000 according to Michigan Conservation Department estimates. Compared with 1961, the commercial catch was down about 2,437,000 pounds and the value dropped about \$463,000.

Chubs, lake herring, carp, and yellow perch were the leading varieties in 1962. These species accounted for 76 percent of the poundage and were valued at \$1,660,000. Approximate landings for the four leading species were: chubs, 6,354,000 pounds; lake herring, 5,943,200; carp, 2,914,600; and yellow perch, 1,506,300. Landings of low value alewife totaled 1,398,800 pounds. Commercial landings of smelt amounting to 1,181,750 pounds were the lowest since 1950.

The 1962 lake trout catch reached an all-time low of 135,467 pounds. All but 325 pounds came from Lake Superior where commercial lake trout fishing was cancelled June 1, 1962, in a continuing effort to boost the comeback of that species in the upper Great Lakes.

Only 819,600 pounds of whitefish were taken by commercial fishermen in 1962--sharply lower than their annual catch which averaged about 3 million pounds before lamprey predation started making inroads on populations of that species.

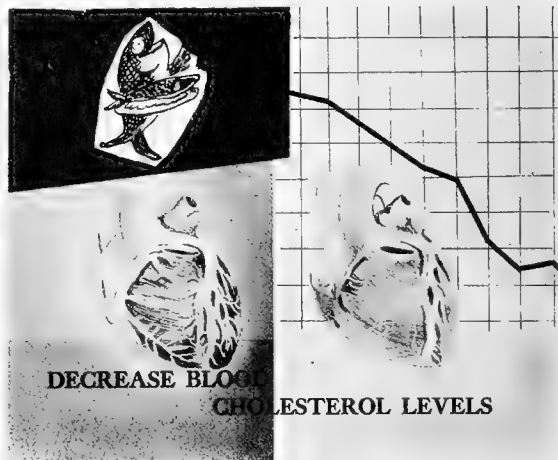
Commercial landings of all species totaled about 6,819,000 pounds from Lake Superior; 2,687,550 from Green Bay; 4,865,620 from Lake Michigan; 3,184,400 from Saginaw Bay; 2,692,200 from Lake Huron; and 1,837,960 from Lake Erie. (Michigan Department of Conservation, April 1963.)



National Fisheries Institute

EXPERIMENTS INDICATE FISH DIET IMPROVES HEALTH:

Experiments in Halifax, N. S., whereby the general health of groups of policemen, fire-



men, and businessmen vastly improved when they included fish in their diet 3 to 5 times a week was the subject of a talk at the 18th annual convention program of the National Fisheries Institute at Philadelphia, April 26-30, 1963.

The Halifax doctor, who prescribed the diets, told his audience that after a period of 2 years, the men on the diet found that their cholesterol had dropped, they had lost excess weight, and they felt better than they had for years.

The doctor explained that he had selected groups of policemen and firemen because they were most likely to stay in one location

where they could be observed. However, the men were not on a controlled diet, but ate their meals in a family situation.

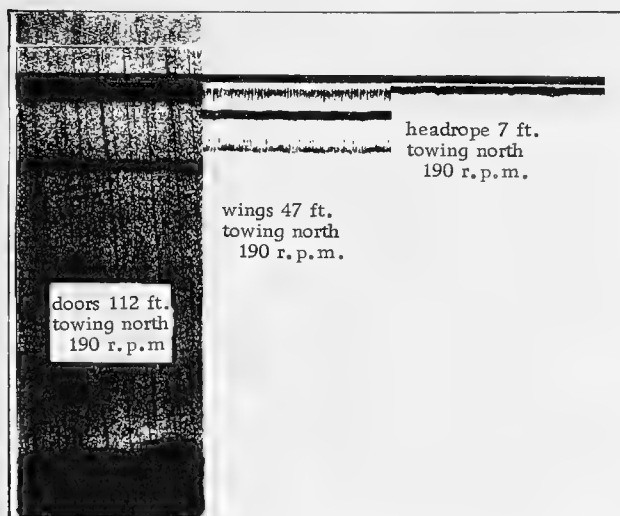
In explaining the effects of high cholesterol, thought by some nutritionists to be the result of including too much saturated fat in the diet, the doctor illustrated his talk with a model of plastic tubing. He showed how cholesterol builds up in the arteries, causing heart disease and strokes.



North Atlantic Fisheries Exploration and Gear Research

ELECTRONIC TRAWL-NET MEASURING AND TELEMETERING SYSTEM TESTED AND EVALUATED:

M/V "Delaware" Cruises 63-2 and 63-3 (March 7-28, 1963): The main objectives of Cruise 63-2 by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware were: (1) to test and evaluate the performance of a "sonic" trawl-net measurement and telemetering system, and (2) to measure "electronically" various in-use dimensions of a No. 41 otter-trawl net.



An echo-sounder recording of the linear dimensions measured during Cruise 63-2. The length of trawl warp used during this recording was 75 fathoms; depth of water was 26 fathoms.

A suitable trawling area on Stellwagen Bank was chosen for the initial performance tests. The remainder of the tests and the collection of instrumentation and measurement data was conducted on good trawlable bottom (about 26 fathoms) in an area 15 miles

SSE of "No Mans Land Buoy" (buoy located approximately 24 miles south of New Bedford, Mass.).

The cruise was temporarily interrupted due to early trawling difficulties not related to the sonic-system and the vessel was forced to return to port. After net repairs had been effected and damaged instrumentation cables had been replaced, the vessel returned to the fishing grounds to complete the tests. Further minor adjustments were required to certain components of the system; the remainder of the cruise was devoted to measuring the various linear dimensions of the trawl net.

Cruise 63-3 was a continuation of measurement data collection begun during the preceding cruise. A total of 35 complete drags was made during the two cruises. Each drag lasted approximately 2 hours and consisted of 4 runs around the perimeter of a 1½-mile square. This pattern of towing was used to determine what influence (if any), tide direction exerted upon the trawl net configuration. All components of the system worked very well and data collection proceeded without interruption.

A standard No. 41, roller rigged, manila trawl net was used throughout the two cruises with (a) thirty-six 8-inch floats secured to the headrope, (b) ten-fathom ground cables and five-fathom legs, and (c) trawl doors measuring 10 feet 6 inches x 54 inches weighing approximately 1,440 pounds.

The method used, for determining the net dimensions taken, was as follows:

(A) A "sonic" transducer was mounted on each trawl door and the two were electrically operated in parallel to measure the distance between the doors.

(B) Two transducers, operated in parallel, were also used to determine the wing-end spread. These were mounted on fiberglass-covered plywood vehicles which were constructed in such a manner that the transducer beams would always be aligned with one another. Flotation was added so that the vehicles would have neutral buoyancy.

(C) The headrope height was measured by a single transducer which was mounted on the headrope and beamed at the ocean bottom.

(D) A stepping switch, mounted on the headrope, was used to selectively telemeter

measurement information to a shipboard recording unit via an electric cable used as a "third" wire.

(E) The stepping switch was controlled automatically (or manually) from the wheelhouse aboard the vessel for the relay of information from specific instruments.

(F) A bottom contact switch was mounted on the footrope to constantly indicate when the net was on the ocean bottom.

Tentative Conclusions: (1) the tidal effect alone upon door spread caused a variation of from 7 to 19 feet; (2) the tidal effect alone upon wing-end spread caused a variation of from 3 to 7 feet; (3) the length of trawl cable and towing speed had little effect on the headrope height although this dimension was slightly less at faster towing speeds; (4) the headrope height varied from 7 to 7.5 feet; (5) the tide had a slight effect on the headrope height; (6) maximum trawl-door spread (162 feet) was attained when using 125 fathoms of trawl wire and towing at 190 r. p. m. (average speed 2.92 knots); (7) minimum trawl-door spread (110 feet) was attained when using 75 fathoms of trawl wire and towing at 190 r. p. m.; (8) maximum wing-end spread was 60 feet (125 fathoms of trawl wire at 190 r. p. m.); and (9) minimum wing-end spread was 45 feet (75 fathoms of trawl wire at 190 r. p. m.).

This cruise report summarizes the methods used to obtain the measurement data and lists the maximum and minimum dimensions attained. A detailed analysis of the measurement system and the measurements taken on these exploratory cruises will appear in a later publication.

* * * * *

TUNA STOCKS OFF U. S. ATLANTIC COAST SURVEYED:

M/V "Delaware" Cruise 63-4 (April 22-June 10, 1963): The U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware (Cruise 63-4) began a 53-day cruise on April 22 to survey the tuna resources in the western, central, and eastern North Atlantic. The 53-day cruise was jointly sponsored by the Bureau, the Woods Hole Oceanographic Institution, and the National Geographic Society.

Cruise objectives included an investigation of the distribution, abundance, migration, and evaluation of the commercial fishing potentials of tunas in those areas. Long-line gear was used to sample subsurface fishes at selected stations, lures were trolled to sample fish in the surface layer between stations, and mid-water trawl gear was used at long-line stations to aid in studying the abundance and distribution of smaller fishes. Considerable emphasis was placed on tagging of live adult tunas.

The Bureau's research vessel Geronimo from the Biological Laboratory at Washington, D. C., was scheduled to join the Delaware for the last part of the cruise to make hydrographic transects in the Gulf Stream area off the Middle Atlantic states. Scientific data collected by the research vessel was to be correlated with fishing results from Delaware stations.

Cooperating agencies were the Bureau's Ichthyological Laboratory at the U. S. National Museum, the Museum of Comparative Zoology at Harvard University, and the University of Miami Marine Laboratory at Miami, Fla.

Foreign scientists, working in similar fields of endeavor, from Canada, Germany, Norway, and Portugal were observers aboard the Delaware during two parts of the cruise.

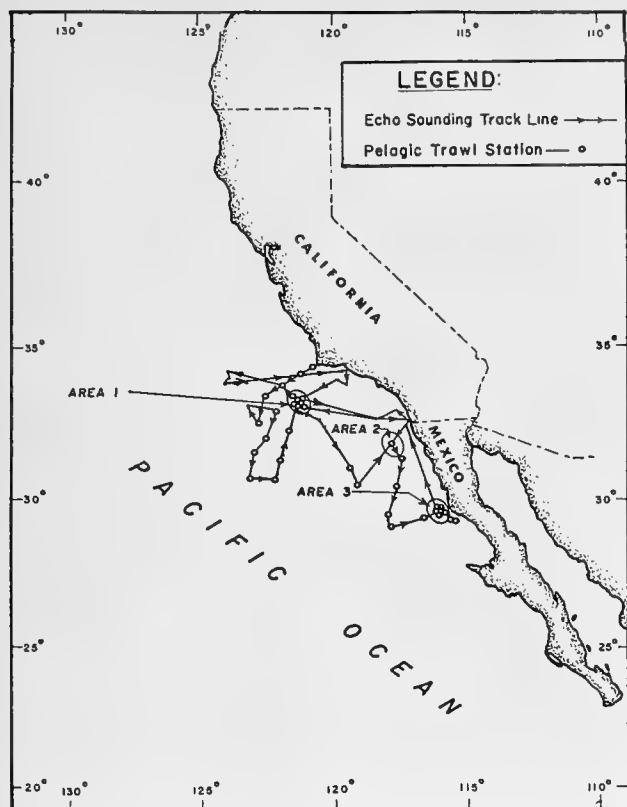
The vessel was scheduled to make port calls at Ponta Delgada, Azores, and at Bermuda before its return to Gloucester, Mass., in June.



North Pacific Exploratory Fishery Program

DISTRIBUTION AND ABUNDANCE OF ADULT HAKE OFF SOUTHERN CALIFORNIA AND NORTHERN MEXICO STUDIED:

M/V "John N. Cobb" Cruise 58 (February 20-April 5, 1963): Pelagic trawling for adult hake by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb off Southern California and Baja California was part of a joint survey with the Bureau's research vessel Black Douglass. The cruise was planned to use the biological and oceano-



John N. Cobb Cruise 58, February 20-April 5, 1963.

graphic facilities of the Black Douglass in close proximity to the search and fishing gear facilities of the John N. Cobb.

Principal objective of the joint cruise was to determine the relative distribution and abundance of adult hake (Merluccius productus). The probable existence of vast quantities of adult hake had been previously predicted as a result of analysis of plankton net catch data, compiled in prior years. These data indicate relatively large amounts of hake eggs and larvae are normally present during late winter months in offshore waters between Point Conception, Calif., and Cedros Island, Mexico.

Standard Cobb pelagic trawls rigged to spread in a conventional manner with two aluminum Cobb pelagic hydrofoils and 60-fathom bridles were used during most of the cruise. During the first four drags an experimental Cobb pelagic trawl constructed of all monofilament webbing was tested and found unsatisfactory due to slippage of knots in the wing sections. No appreciable increase in speed was noted while the monofilament net was in use.

A full length (40 feet) cod-end liner constructed of $\frac{1}{2}$ inch (stretch measure) webbing was used during most of the drags to sample small fishes and invertebrates.

Fishing depth of the net during most of the cruise was determined by utilizing a scope ratio experience table compiled during the cruise by using a trolley-mounted bathythermograph to record various depths of the otter boards. The trolley-suspended bathythermograph was lowered and retrieved along the towing cable (after equilibrium of the net had been established) in increments of 25 and 50 fathoms of towing cable out. The resulting series of depths were then plotted to establish a curve which was used thereafter to position the net.

The survey was conducted along a trackline predetermined to cross those areas which had most consistently produced relatively large catches of hake eggs and larvae during the preceding 10 years. Station patterns along the trackline were made to coincide with certain California Cooperative Fisheries Investigations standard stations.

Continual echo soundings were by the John N. Cobb between all stations and during midwater sampling drags.

Routine drags were made on arrival at standard stations whenever weather permitted. Depth of drags varied from surface to 350 fathoms, depending on vertical position of scattering layers, lack of scattering layer, or indication of fish as determined by the echo sounder. Deep drags using all cable available were usually made at stations having no indication of fish or scattering layer. The length of drags varied between one hour and three hours. Most drags lasted two hours.

A total of 36 drags was made and approximately 2,000 miles of trackline were surveyed by echo sounding. Most of the tracklines and stations surveyed gave no indication of availability of fish either by analysis of echo soundings or catches of fish in the trawl. However, three areas were located which indicated the presence of fish by echo soundings and catch rates ranging from a single adult hake to 675 pounds. Centers of those three areas were located: (1) about 25 miles northwest of the San Juan Seamount; (2) about 18 miles southeast of Sixty-Mile Bank; and (3) about 15 miles southwest of Punta Baja, Mexico. Echo soundings made in those areas indicated relatively wide dispersion of fish extending over several square miles. Area 3 off Punta Baja was circumnavigated by echo

sounding and was found to cover approximately 23 square miles. Although areas 1 and 2 were not accurately circumnavigated, they appeared to be much larger, based on the length of time required to go across the area at a speed of ten knots. With an assumption that each echo sounding track through areas 1 and 2 passed through the main body of fish, it would then appear that area 1 covered approximately 1,600 square miles and area 2 covered over 100 square miles.

Persistent bad weather and the need to carry out preprogrammed phases of the cruise, involving explorations in other areas, limited the number of drags in each area to 7 in area 1, 1 in area 2, and 5 in area 3.

Five hake were also taken in a routine drag 50 miles west of the San Juan Seamount.

Preliminary examination of captured hake showed the catch composition to be mostly

Catches per Drag in Areas 1, 2, and 3.							
Area	Hake Catch per Drag (No. of Fish)						
1	1	9	2	0	0	4	41
2	29						
3	129	3	65	300	495	1/0	41

males in spent or partially spent condition. Most of the females were completely spent. On one occasion, eggs from a ripe female were fertilized. The culture obtained was then sampled and preserved at one-hour intervals to a maximum of 12 hours. Lengths of hake taken during the cruise ranged from 30 to 70 centimeters (11.8-27.6 inches).

In every drag (14) which produced hake the following conditions existed: (1) proximity to seamounts, islands, continental shelf, and banks less than 60 miles; (2) indication of fish on echo-sounding machine; (3) good catches of recently spawned hake eggs made by the Black Douglass; and (4) fishing depth of the pelagic trawl exceeded 60 fathoms.

Several rare and semi-rare specimens of deep-sea fishes and invertebrates were also captured and preserved for future study by scientists at the Bureau's Biological Laboratory, La Jolla, Calif.

Fillets of hake were cooked and eaten on both the John N. Cobb and Black Douglass. All persons participating in the experiment were favorably impressed with flavor, texture, and palatability. Most common remarks were: "delicious," "excellent," and "good."

Oceanography

INSTRUMENTATION, FACILITIES AND EQUIPMENT DISCUSSED AT ICO MEETING:

A panel of the Interagency Committee on Oceanography (ICO) met on February 19, 1963, and considered the uses of telemetering systems.

An official of the National Aeronautics and Space Administration (NASA) discussed the advances made in the field of satellite collection of surface-secured information. He announced that a contract is under negotiation with the Stanford Research Institute to investigate and summarize the various telemetering requirements of the oceanographic, meteorological and other platforms anticipated by different agencies. The study will be designed to find out if uses and requirements are compatible. Specifications for program feasibility will be prepared first. It is desired to determine who the potential users are, the amount of information required, the number and types of surface platforms and the interval of radio contact. Study of the facts will begin in the fall of 1963. Industry will then be invited to develop the system. It is hoped that development will begin in early 1965, with the first flight test possible two years later. (U.S. National Oceanographic Data Center, Newsletter, March 31, 1963.)



Oysters

FLORIDA DRILL STOPPED BY TREATED SAND:

The Florida oyster drill (*Thais haemostoma*) is being studied at the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn. It has been shown that the Florida drill cannot cross a 6-inch barrier of sand treated with Polystream. Individual specimens did, however, penetrate the barrier as far as three inches thereby indicating considerably more resistance to the compound than local oyster drills such as *Urosalpinx cinerea* and *Eupleura caudata*.



South Atlantic Exploratory Fishery Program

AVAILABILITY OF CALICO SCALLOPS OFF GEORGIA AND FLORIDA COASTS RESURVEYED:

M/V "Silver Bay" Cruise 47 (March 25-April 11, 1963): The primary purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay was to assess the location, distribution, and availability of calico scallops (Pecten gibbus) six months after the last survey (map p. 42).

A total of 202 drags, averaging 30 minutes each, were made between St. Simons Island, Ga., and Ft. Pierce, Fla. Six- and eight-foot tumbler dredges with 2-inch bag rings were used. Some were fitted with $2\frac{1}{2}$ -inch-mesh nylon liners.

Dead scallop shell dominated catches in 12 to 30 fathoms in all areas surveyed except in a portion of the area lying north of Jacksonville, Fla., and individual live scallops were taken over a total depth range of 10 to 28 fathoms. Best catches were made north off Cape Canaveral, Fla., in 25 fathoms (approximate latitude $28^{\circ} 54' N.$), but nowhere did catches exceed $3\frac{1}{2}$ bushels per drag. Scallops taken averaged 55 millimeters ($2\frac{1}{4}$ inches) in shell width, and all specimens examined were in spawning condition. Meats from these were fair to poor in quality and averaged about 155 to the pint. Data from previous explorations have indicated that such low yields are to be expected in the spring.

Scallop samples were collected for further study by Bureau technologists and biologists. Live calico scallops were landed to assist two industry organizations in their respective development of processing equipment.

Note: See Commercial Fisheries Review, January 1963 p. 53 and November 1962 p. 43.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1963:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for January-March 1963:

Shrimp Studies: Unusually cold weather in January-March 1963 resulted in below normal water temperatures throughout inshore areas. Experimental trawl fishing under the shrimp survey program indicated that marine life in inside waters was affected by the low temperatures. In the first quarter of 1963, the survey yielded a catch of white shrimp that was down about 90 percent from that in the same period of the previous year. The catch of blue crab, spot, and croaker was also down, although the decline was less drastic.

The effects of the subnormal water temperatures may have been only temporary. The decrease in the shrimp survey catch could be merely an indication that most of the shrimp, fish, and crab populations moved to deeper offshore waters. When water temperatures began to rise in March, many species of fish and shellfish showed a rapid increase in abundance throughout inside waters. The effects of the cold on the white shrimp population will not be known until June 1963, when the spawning crop of white shrimp postlarvae begin to enter coastal waters.

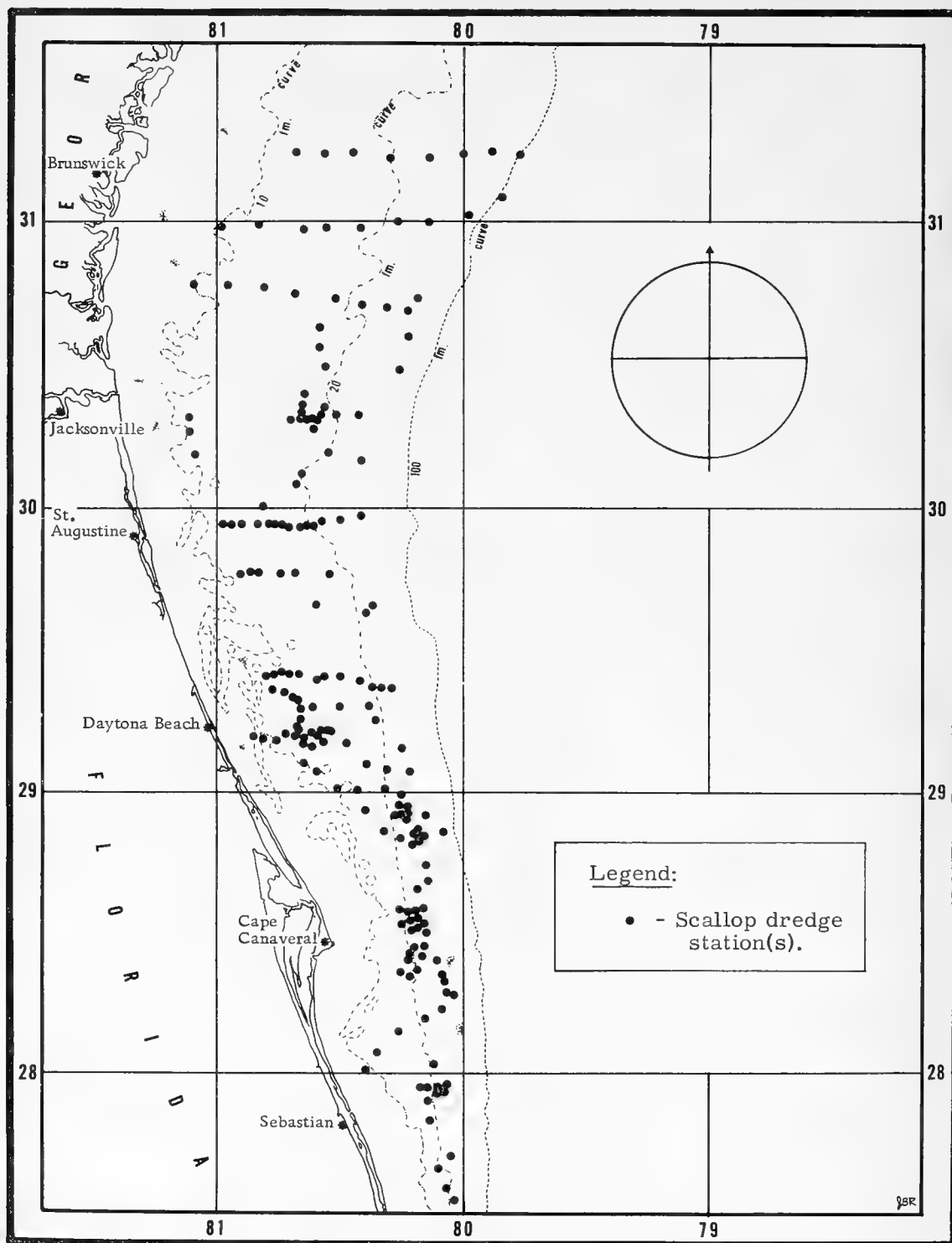
Brown shrimp postlarvae were several weeks late in entering coastal sounds and rivers in 1963. It was not until late March that they became at all plentiful, and even then they were running well behind the 1962 tabulations both in time and number. The below average water temperatures may have been responsible for the delay. But the March returns indicated that the commercial brown shrimp catch in 1963 would be less than that of the previous year, unless the postlarvae became very numerous in April.

Because the postlarvae appeared at least three weeks later in 1963 than they did in 1962, it seemed likely that the commercial catch of brown shrimp would be delayed this year by 2 or 3 weeks.

In contrast to the late appearance of shrimp postlarvae, postlarval spot and croaker showed a more normal pattern of recruitment.

Pond Cultivation: Experimental ponds were prepared for the stocking of brown shrimp during the first quarter of 1963. Flood gates, screens, and overflow pipes were repaired and the ponds were flushed out with tidal water for several days.

One of the 1-acre experimental ponds was opened on March 15, at which time postlarval



Shows the station pattern for cruise 47 of the M/V Silver Bay, March 25-April 11, 1963.

brown shrimp began to appear in a nearby creek. The pond was allowed to stock naturally through the intake of water on each flood tide. Another 1-acre pond was also allowed to stock naturally, and it was hoped that this could be supplemented by the addition of postlarval and juvenile shrimp caught by nets in nearby waters. Both ponds were to be treated with rotenone to remove predaceous fishes as soon as stocking was completed.

Other experiments conducted in conjunction with pond cultivation included attempts at raising postlarval shrimp in large concrete tanks, and in large and small aquaria. The work will be carried on and intensified with white shrimp postlarvae in June and July.



Tuna

NEW ENGLAND PURSE-SEINE FISHERY TAKES LEAP FORWARD IN 1962:

The development of a large-scale commercial tuna fishery in New England made considerable progress in 1962. West Coast tuna interests were active in this fishery for the first time, and sent large purse seiners to fish for tuna out of New England ports. Seven tuna purse seiners operated off New England between July and October 1962. During that period they landed about 3,300 short tons of tuna, mostly bluefin with some skipjack. An estimated additional 250 tons were caught by traps and sportsmen. There were indications that the New England purse-seine fishery will continue to expand in the future. Some West Coast interests were considering the feasibility of building canneries in the New England area.

The new trend in purse seining for tuna in New England had its beginning in 1958 when a Provincetown, Mass., vessel commenced purse seining for tuna with gear loaned by the U. S. Bureau of Commercial Fisheries, and as a result of the Bureau's exploratory fishing in 1951-53. Table 1 illustrates how the New England tuna landings by all types of gear have increased since 1958.

Purse-seine tuna was landed at 4 New England ports in 1962 (table 2). The larger seiners landed at New Bedford, Mass., and Providence, R.I. Four of the smaller ves-

Table 1 - New England Tuna (All Species) Landings by State, 1952-62^{1/}

Year	Mass.	Me.	R. I.	Conn.	Total
	(Short Tons)				
1962 ^{2/}	2,900.0	50.0	600.0	-	3,550.0
1961	1,105.0	52.5	19.0	-	1,176.5
1960	593.0	83.0	19.0	-	695.0
1959	1,329.0	31.0	30.5	-	1,390.5
1958	1,189.5	22.5	20.0	0.5	1,232.5
1957	441.0	13.5	24.0	2.0	480.5
1956	193.0	9.5	10.0	2.0	214.5
1955	402.0	13.0	29.5	2.0	446.5
1954	672.5	1.5	78.5	1.0	753.5
1953	929.0	25.0	16.0	2.5	972.5
1952	537.6	18.5	16.9	3.9	576.9

^{1/}Includes landings by all types of gear.

^{2/}Preliminary.



Fig. 1 - One of the large West Coast-type tuna purse seiners that fished for tuna in New England waters in the summer and fall of 1962.

sels landed catches at New Bedford earlier but changed to Sagamore, on the Cape Cod Canal, in August when they started fishing in Massachusetts Bay. Landings at Provincetown were by one local vessel.

Table 2 - New England Purse-Seine Tuna Landings by Port and Species, 1962^{1/}

Port	Trips No.	Bluefin	Skipjack	Total
		(Short Tons)		
New Bedford, Mass. . . .	34	1,430.9	380.5	1,811.4
Provincetown, Mass. . . .	13	229.4	0.4	229.8
Sagamore, Mass.	50	684.2	-	684.2
Providence, R. I.	3	494.7	90.0	584.7
Total	100	2,839.2	470.9	3,310.1

^{1/}Preliminary.

The 1962 purse-seine tuna season commenced when the first trip was landed July 12; the last trip was landed on October 17. Tuna landings were heaviest in August and September (table 3). Fishing was reported generally better south of Cape Cod in 1962, and tuna were not as plentiful in the Massachusetts Bay as in some previous years. The summer

Table 3 - New England Purse-Seine Tuna Landings by Week, 1962

Week Ending		Trips	Bluefin	Skipjack	Total
		No.	(Short Tons)		
July	14.	3	14.7	-	14.7
	21.	7	121.3	-	121.3
	28.	4	66.4	-	66.4
Aug.	4.	11	439.1	110.5	549.6
	11.	9	393.8	185.5	579.3
	18.	6	187.3	138.4	325.7
	25.	6	82.7	-	82.7
Sept.	1.	11	378.0	36.5	414.5
	8.	8	407.9	-	407.9
	15.	6	106.1	-	106.1
	22.	11	366.5	-	366.5
	29.	4	36.2	-	36.2
Oct.	6.	9	62.9	-	62.9
	13.	2	137.8	-	137.8
	20.	3	38.5	-	38.5
Total.		100	2,839.2	470.9	3,310.1

weather in New England averaged much cooler than normal, and fog and overcast conditions hampered spotting of the fish by airplane.

Fishing was fair to good off Long Island, N. Y., early in the season, but excellent fishing on Pollock Rip, south of Cape Cod, attracted the vessels in late August and early September. The 3 larger purse seiners fished mostly in both areas, while the 4 smaller vessels fished in Massachusetts Bay.

Skipjack tuna were caught in large quantities off Block Island in August. They were the first known large catches of skipjack tuna in the western North Atlantic.

Most of the 1962 tuna landings were frozen on shore for canning in plants on both the East and West Coasts. Small amounts were sold on the fresh-fish markets in Boston and New York. One large shipment of over one million pounds of frozen bluefin tuna was exported to Italy in September.



Fig. 2 - Unloading tuna from the hold of one of the large purse seiners. The large galvanized buckets used for unloading have a capacity of about 1,000 pounds.



Fig. 3 - Another view of unloading operations showing large galvanized bucket used to bring the tuna from the hold to the wharf and the racks for transporting the fresh tuna to the freezer.

The purse-seine fleet fishing New England waters in 1962 was comprised of 4 vessels under 150 gross tons and 3 larger vessels (table 4). Two were local vessels that fished out of New England in 1961, 2 seiners were purchased by New England interests from a West Coast owner, and 3 large seiners were provided by West Coast firms.

Table 4 - New England Purse-Seine Tuna Landings by Size of Vessel, 1962

Vessels		Trips	Bluefin	Skipjack	Total
Size	No.	No.	(Short Tons)		
150 Gross Tons and over . . .	3	24	1,676.9	431.0	2,107.9
Under 150 Gross Tons . .	4	76	1,162.3	39.9	1,202.2
Total.	7	100	2,839.2	470.9	3,310.1

During August 1962 one of the large West Coast purse seiners landed a trip of 250 tons of tuna at New Bedford, Mass. This was the largest single trip landed at a New England port. However, the largest seiner in the fleet made only one trip in September and caught 350 tons off New England. Only 10 tons of tuna from that trip was landed at New Bedford and the remainder was delivered to Puerto Rico. The vessel fished in the Pollock Rip area for 15 days and made only 7 sets.

Several large West Coast tuna-canning firms conducted surveys of New England ports with a cannery site in mind. Gloucester, New Bedford, and Providence were the chief ports of interest. One firm was given an option on a 7½-acre site at the Municipal Wharf in Providence.

Tuna unloading facilities were constructed on piers at New Bedford and Providence early



Fig. 4 - View of fresh bluefin tuna on sorting table preparatory to racking and freezing.



Fig. 5 - Forklift truck loading six-foot high pallets or racks into truck for transport to freezer.

in the 1962 season. A new union was chartered in Providence to handle the unloading of tuna. Some of the New England-caught tuna were shipped to a tuna cannery in Maryland which was built in early 1962.

Commercial tuna seining in some inshore areas met with opposition by sport fishermen in Massachusetts and New York during the year. Massachusetts authorities were requested to close some areas to commercial tuna fishing but no action was taken.

Although there may be some problems to overcome, the prospect of a large tuna fishery in New England appears to be promising.

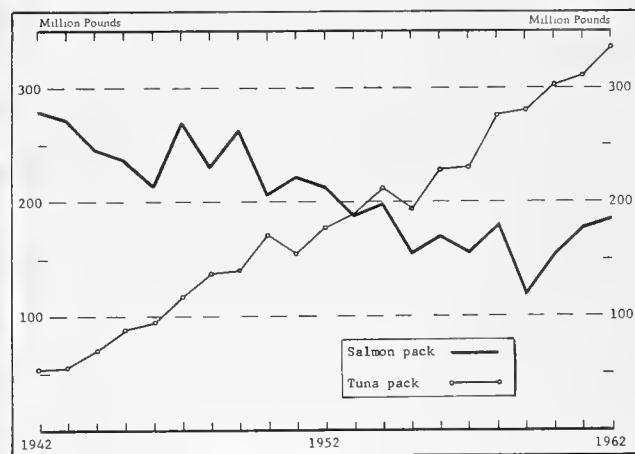
--John J. O'Brien
Supv. Market News Reporter
Fishery Market News Service
Boston, Mass.



United States Fisheries

CANNED FISHERY PRODUCTS, 1962:

The 1962 pack of canned fishery products by 373 plants in the United States, American Samoa, and Puerto Rico amounted to 36.9 million standard cases (1.1 billion pounds) valued at \$455.7 million to the packers. Compared with 1961, production was up 3.5 million cases (92 million pounds) and \$32.8 million. The increases resulted from a record pack of tuna and large packs of Maine sardines and animal food. Salmon also contributed to the increase in volume while the value of shrimp was much higher in 1962 than in 1961.



Pack of salmon and tuna, 1942-62.

The pack for human consumption (758.6 million pounds) was nearly 50 million pounds above that of 1961. The production of bait and animal food (376.4 million pounds) was about 42 million pounds larger. The pack of canned animal food amounted to 4,838,739 standard cases valued at \$17,056,610. The value of three items--salmon, tuna, and animal food--accounted for 79 percent of the total value of canned fishery products.

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FISH STICKS AND PORTIONS PRODUCTION, 1962:

The United States production of fish sticks and portions during 1962 amounted to 150.9 million pounds with a value of \$58.2 million--a gain of 16 percent in quantity and 11 percent in value as compared with 1961. Fish sticks totaled 72.2 million pounds in 1962--2.4 million pounds or 3 percent above 1961, and fish portions amounted to 78.7 million pounds--up 18.8 million pounds or 31 percent.

Cooked fish sticks (66.8 million pounds) made up 93 percent of the 1962 fish stick total, while the remaining 5.4 million pounds or 7 percent consisted of raw fish sticks. A total of 76.3 million pounds of breaded fish portions (of which 62.3 million pounds were raw) and 2.4 million pounds of unbreaded portions was processed during 1962.

Table 1 - U.S. Production of Fish Sticks by Months and Type, 1962 1/

Month	Cooked	Uncooked	Total
	(1,000 Lbs.)		
January	5,689	393	6,082
February	6,511	375	6,886
March	7,223	435	7,658
April	5,241	478	5,719
May	5,151	492	5,643
June	4,698	419	5,117
July	3,319	421	3,740
August	5,350	410	5,760
September	6,056	526	6,582
October	6,138	560	6,698
November	5,808	497	6,305
December	5,617	410	6,027
Total quantity 1962 1/	66,801	5,416	72,217
Total quantity 1961 2/	65,006	4,818	69,824
	(\$1,000)		
Total value 1962 1/	28,029	2,047	30,076
Total value 1961 2/	28,321	1,779	30,100

1/Preliminary.
2/Revised.

Table 2 - U.S. Production of Fish Sticks by Months, 1959-62

Month	1/1962	2/1961	1960	1959
	(1,000 Lbs.)			
January	6,082	6,091	5,511	6,277
February	6,886	7,097	6,542	6,352
March	7,658	7,233	7,844	5,604
April	5,719	5,599	4,871	4,717
May	5,643	5,129	3,707	4,407
June	5,117	4,928	4,369	4,583
July	3,740	3,575	3,691	3,790
August	5,760	6,927	5,013	3,879
September	6,582	5,206	5,424	5,353
October	6,698	6,133	6,560	5,842
November	6,305	6,288	6,281	4,831
December	6,027	5,618	5,329	4,743
Total	72,217	69,824	65,142	60,378

1/Preliminary.
2/Revised.

Table 3 - U. S. Production of Fish Sticks by Areas, 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	26	57,398	23	57,246
Inland & Gulf States	6	8,331	7	6,744
Pacific Coast States	10	6,488	10	5,834
Total	42	72,217	40	69,824

1/Preliminary.
2/Revised.

Table 4 - U. S. Production of Fish Portions by Areas, 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	26	44,072	26	34,496
Inland & Gulf States	12	32,081	12	23,945
Pacific Coast States	8	2,525	6	1,406
Total	46	78,678	44	59,847

1/Preliminary.
2/Revised.

Table 5 - U. S. Production of Fish Portions by Months, 1962 1/

Month	Cooked	Breaded	Total	Un-breaded	Total
	(1,000 Lbs.)				
January	966	3,979	4,945	132	5,077
February	788	5,306	6,094	266	6,360
March	1,340	5,510	6,850	186	7,036
April	1,450	4,806	6,256	152	6,408
May	1,189	4,478	5,667	151	5,818
June	1,083	4,876	5,959	178	6,137
July	507	4,006	4,513	166	4,679
August	973	5,569	6,542	145	6,687
September	1,579	5,423	7,002	178	7,180
October	1,805	7,711	9,516	355	9,871
November	1,067	6,058	7,125	281	7,406
December	1,260	4,568	5,828	191	6,019
Tot. qty. 1962 1/	14,007	62,290	76,297	2,381	78,678
Tot. qty. 1961 2/	11,003	46,783	57,786	2,061	59,847
	(\$1,000)				
Tot. value 1962 1/	5,999	21,257	27,256	833	28,089
Tot. value 1961 2/	4,544	16,843	21,378	805	22,192

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1959-1962

Month	1/1962	2/1961	1960	1959
	(1,000 Lbs.)			
January	5,077	4,303	3,632	2,692
February	6,360	4,902	3,502	3,025
March	7,036	5,831	4,706	3,225
April	6,408	4,484	3,492	2,634
May	5,818	3,879	3,253	2,684
June	6,137	4,039	3,995	3,247
July	4,679	3,962	4,088	2,227
August	6,687	4,963	3,558	2,796
September	7,180	5,745	4,631	3,558
October	9,871	6,759	5,275	4,314
November	7,406	5,789	4,790	3,483
December	6,019	5,191	4,459	3,262
Total	78,678	59,847	49,381	37,147

1/Preliminary.
2/Revised.

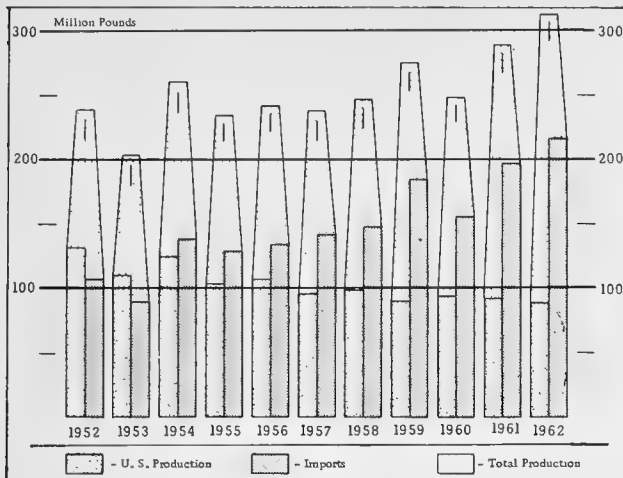
The Atlantic Coast was the principal area in the production of both fish sticks and fish portions with 57.4 and 44.1 million pounds, respectively. The inland and Gulf States were next with 8.3 million pounds of fish sticks and 32.1 million pounds of fish portions. The Pacific Coast States made up the remaining 9 million pounds of fish sticks and fish portions.

* * * * *

PACKAGED FISHERY PRODUCTS PRODUCTION, 1962:

Production of fresh and frozen packaged fish fillets and steaks in the United States in 1962, totaled nearly 170 million pounds valued at \$58 million to the processors. Compared with 1961, this was an increase of nearly 12 million pounds and \$7 million. It was estimated that round fish weighing 486.1 million pounds were required for the 1962 production.

The domestic production of groundfish fillets, steaks, etc., amounted to 90.5 million



Supply of groundfish fillets, 1952-62.

pounds, 2.5 million pounds less than in 1961, and 58.2 million pounds below the 148.8 million-pound-peak production of 1951. In New England, the production of flounder fillets increased 43 percent (from 18.2 million pounds in 1961 to 26 million pounds in 1962) largely as a result of excellent yellowtail flounder fishing. New England production of whiting fillets was also up from 3.3 million pounds in 1961 to 6.2 million pounds in 1962--an increase of 87 percent.



U.S. Fishing Vessels

ANOTHER LARGE STEEL TRAWLER ADDED TO BOSTON FLEET:

The Boston, Mass., fishing fleet acquired a second new steel trawler when the Sturgeon Bay arrived at the Boston Fish Pier on May 1, 1963. The vessel is identical to the first new trawler, the Massachusetts, which started fishing out of Boston in December 1962.

The 124-foot Sturgeon Bay was built in a Sturgeon Bay, Wis., shipyard for a Wisconsin firm which operates fishing trawlers out of Boston. Construction of the vessel was aided by a Federal grant of \$153,000 under the vessel subsidy program of the U. S. Bureau of Commercial Fisheries. The total cost of the vessel was about \$461,000.

The Sturgeon Bay will be used in the New England groundfish fishery (cod, haddock, hake, pollock, cusk, and ocean perch). It has a fish hold capacity of 250,000 pounds and will carry a crew of about 17.

The addition of the Sturgeon Bay is another step forward in the revitalization of the New England groundfish fleet which has been hurt by competition from newer vessels operating out of foreign countries. Three other fishing vessels for use in the New England groundfish fishery are now under construction with the aid of Federal construction grants--2 wooden trawlers (95-foot and 80-foot) for New Bedford, Mass., owners, and a 100-foot wooden trawler for a Rockland, Maine, owner.

Under the fishing vessel construction grant program, up to one-third of the cost of building a fishing vessel can be financed by the Federal Government. This is to offset the lower construction cost of vessels built in foreign shipyards. Mortgage insurance and a loan program are other projects designed to help the American fishermen.

Note: See Commercial Fisheries Review, February 1963 p. 54

BOTTOM FISHING VESSELS URGED TO COMPLY WITH INTERNATIONAL REGULATIONS:

The presence of foreign flag fishing vessels on the fishing grounds off the New England coast stresses the importance for captains of United States fishing vessels to conform



strictly with provisions of the "International Regulations For Preventing Collisions at Sea" while operating their craft in international waters. Rule 9 (e) (III) prescribing signals to be displayed by fishing vessels operating nets or dredges along the sea bottom is of special importance to trawlers and scallop

dredgers. This rule states that "All Vessels Towing Nets or Dredges Along the Sea Bottom During Daylight Hours Shall Display a Basket in a Prominent Position."

Rule 26 of the International Regulations states that all vessels not engaged in fishing shall when underway keep out of the way of any vessels fishing with nets, lines, or trawls. Thus, displaying a basket when towing a net or dredge complies with the regulations affecting vessels engaged in bottom fishing, and alerts vessels in the vicinity to keep clear and not interfere with operations. The basket

must be shown only when the vessel is fishing. The U. S. Bureau of Commercial Fisheries urges all vessel captains to conform strictly with the international rules as prescribed or affecting fishing vessel operations.

* * * * *

DOCUMENTATIONS ISSUED AND CANCELLED, MARCH 1963:

During March 1963, a total of 36 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 19 in March 1962. There were 39 documents cancelled for fishing vessels in March 1963 as compared with 43 in March 1962.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, March 1963 with Comparisons					
Area (Home Port)	Mar.		Jan.-Mar.		Total
	1963	1962	1963	1962	
	..... (Number)				
<u>Issued first documents 2/:</u>					
New England	1	1	4	3	28
Middle Atlantic	1	1	2	1	3
Chesapeake	3	1	6	7	43
South Atlantic	6	3	13	7	47
Gulf	17	10	40	25	110
Pacific	7	3	16	15	130
Great Lakes	1	-	1	-	5
Puerto Rico	-	-	-	-	2
Total	36	19	82	58	368
<u>Removed from documentation 3/:</u>					
New England	3	1	5	6	24
Middle Atlantic	5	6	15	15	39
Chesapeake	2	-	5	3	23
South Atlantic	4	7	14	14	38
Gulf	13	10	23	29	104
Pacific	11	15	26	42	111
Great Lakes	1	2	3	8	22
Hawaii	-	2	-	3	3
Puerto Rico	-	-	-	-	1
Total	39	43	91	120	365
1/For explanation of footnotes, see table 2.					

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, March 1963		
Gross Tonnage	Issued 2/	Cancelled 3/
..... (Number)		
5-9	11	12
10-19	9	7
20-29	2	-
30-39	-	3
40-49	3	8
50-59	-	2
60-69	1	3
70-79	9	-
110-119	-	1
140-149	-	1
180-189	-	1
240-249	1	-
270-279	-	1
Total	36	39

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes 1 redocumented vessel in March 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 18 in 1963; 2 in 1962; 1 in 1960; 1 in 1955; 1 in 1952; and 13 prior to 1951.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

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NEW RESEARCH VESSEL FOR NORTH ATLANTIC FISHERIES INVESTIGATIONS COMMISSIONED:

Albatross IV, the new fishery-oceanographic research vessel of the U. S. Bureau of Commercial Fisheries was commissioned at Woods Hole, Mass., on May 9, 1963, by Secretary Stewart L. Udall, U. S. Department of the Interior.

At the ceremony, Secretary Udall said, "We are commissioning a new vessel, the Albatross, the fourth in an illustrious line of this name since 1882. The first Albatross was unique and modern for its day--being the first oceanographic research vessel of any consequence constructed in the world. Its two successors were converted vessels. The ship before us, however, is one of the best equipped for this specific purpose by the Federal Government since the first Albatross.

"We have a new Albatross--but we need a fleet of them. For despite our pioneering efforts over 80 years ago, our Nation still thinks of the oceans principally as highways. Today, we approach the sea with a new concept:

"The ocean is the newest and last frontier of the world... ."

The Albatross IV is designed to conduct fisheries and oceanographic research in the Northwest Atlantic. She is especially equipped to collect information on the distribution and abundance of groundfish and sea scallops, and on the environmental factors which affect seasonal and long-term changes in the fish stocks. In addition, she is equipped to study the bottom organisms which form the food supply of groundfish, and to investigate plankton populations and oceanographic conditions generally.

The vessel is a 187-foot single-screw stern trawler powered by twin Diesel engines, and is designed to travel at 12 knots with a range of 9,000 miles. One of the great problems of oceanographic research is holding station and maintaining vertical wire angle. On the Albatross IV, this will be accomplished through the use of a controllable pitch propeller provided with a Kort-type nozzle rubber and a bow thruster. The vessel is reinforced against ice and is air-conditioned to enable its use for general fishery and oceanographic research in any navigable waters in the world--in all seasons--in all reasonable conditions of weather and temperature.

On the Albatross IV, special attention was paid to provision of ample working space on the main deck; to the provision of adequate laboratory space for biological, chemical, and oceanographic work; and to the installation of special gear, handling equipment, and modern electronic devices.

The after part of the vessel's main deck is the main working area. Here is where all of the various kinds of gear will be lowered into the sea and recovered. There is a stern ramp for hauling nets and other gear aboard similar to that in use on many European stern trawlers. Sheaves for carrying trawl warps and other lines are suspended from a moveable gantry which can be rotated hydraulically 115° aft of the vertical and 90° forward and will lift 10,000 pounds. Its main function will be to handle the otter trawl, mid-water trawl, and heavy dredges.

There are 2 hydrographic winches on the after end of the boat deck each with a capacity of 20,000 feet of $\frac{1}{4}$ -inch wire. Collector rings are provided for 5 conductors. The control console is on the end of a 20-foot extension cable so that each winch can be operated either at the winch, at the rail, or on the main deck.

A major effort was made in the arrangement of the laboratory spaces to provide good communications between them as well as with the rest of the ship, but to keep them separate from the traffic of people engaged in other aspects of the ship's business. As little of the furniture and equipment as possible is permanently fastened to the ship's structure so as to permit easy rearrangement to meet the needs of the future.

Just forward of the fishing deck, open aft and on both sides, but sheltered by the house forward and the deck overhead, is a 32 by 10-foot area, designed for the preliminary processing of marine collections. There is a bathythermograph winch with 2,000 feet of $\frac{3}{16}$ -inch wire at each rail. Collector rings are provided for the use of conducting cable. A dumbwaiter communicates with the storage room on the lower deck and up to the boat deck.

Forward of the rough laboratory on the port side is the 13-foot by 33-foot wet laboratory which can be divided into two separate spaces by a moveable bulkhead. Facilities include a wet gear locker, dumbwaiter to

decks below and above, 3 sinks, 3 salt water tables, work benches, overhead cabinets, refrigerator and storage lockers. Every 3 feet along the permanent bulkheads are outlets for 110 volt alternating current, compressed air, cold salt water, hot fresh water, and cold fresh water.

There is an instrument well in the wet laboratory and another in the hydrographic laboratory. These are 3½ feet square and can be opened or closed by a diver or can be used to put divers in the water. Provision was made for a 5-foot diameter fish well in the storage room. It is now part of the fuel oil tank system, but it can be made free-flooding by a minor alteration in the plating. It is anticipated that for the present, live fish will ordinarily be carried in portable tanks on deck or in the storage room supplied with sea water from the laboratory system.

Forward of the rough laboratory on the starboard side is the 10-foot square hydrographic laboratory for the immediate processing of water samples. It has Nansen bottle racks, storage cabinets, work bench, sink, and desk. Over the desk is an instrument panel giving time, ship's heading and speed, water depth, wind direction and velocity, air temperature, relative humidity, sea surface temperature, and barometric pressure. The indicating and recording unit for the telerecording bathythermograph is also visible from the desk.

Communicating with the hydrographic laboratory is a 7-foot by 13-foot space for chemical analysis. It has a sink, work bench, cabinets, freezer, salinometer, and spectrophotometer.

Forward of the chemistry laboratory, the dry laboratory, 15 by 11 feet, has a drafting table, two desks, a work table, cabinets, typewriter, and calculators. There is a fisherman's asdic and a 6,000-foot sounder either of whose signals can be displayed on a precision graphic recorder.

A 5-foot by 6-foot photographic darkroom with all necessary furniture and equipment is just forward of the wet laboratory.

There is a 10-foot by 12-foot laboratory on the after part of the boat deck which is intended primarily for the monitoring, maintenance, and repair of specialized electronic equipment. It has work benches, cabinets,

cable ports, 4 kinds of electric power, and a dumbwaiter communicating with the main and lower decks. Like all other laboratory spaces, it can be readily converted to other purposes.

The gyrocompass, radiotelephone, as well as power supplies and converters for the electronic equipment are housed in a room behind the pilot house on the starboard side. A walk-in refrigerator and a freezer are located on the lower deck at the forward bulkhead.

On May 13, the *Albatross IV* sailed for Georges Bank on her first assignment (Cruise 63-1), which was to collect quantitative samples of the sea scallop population.

Note: See *Commercial Fisheries Review*, January 1963 p. 56 and July 1962 p. 42.

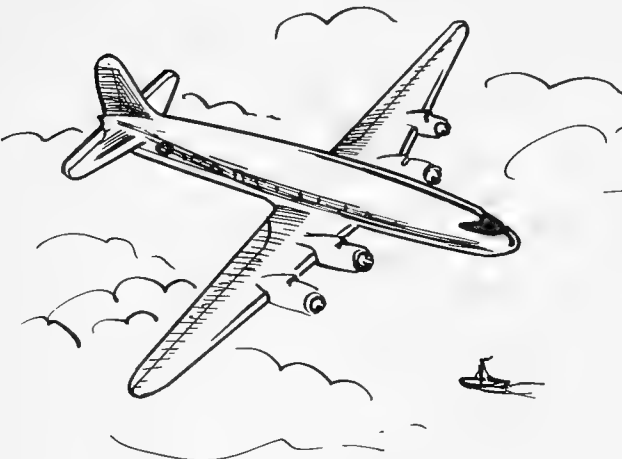


U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, OCTOBER 1962:

Airborne fishery imports into the United States in October 1962 continued at about the same level as in the previous month, but the value of the October airborne shipments was up 11.9 percent due mainly to the arrival of 8,082 pounds of caviar from Iran. The Iranian caviar entered through the U. S. Customs District of New York.

Airborne shrimp imports in October consisted of 832,844 pounds of fresh or frozen raw headless, 90,348 pounds of fresh or frozen peeled and deveined, and 36,134 pounds of unclassified shrimp. Over 92 percent of the airborne shrimp imports in October entered through the Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Galveston (Tex.), Los Angeles (Calif.), and San Francisco (Calif.).



U. S. 1/ Airborne Imports of Fishery Products, January-October 1962				
Product and Origin 2/	October		Jan.-October	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	Pounds	US\$	Pounds	US\$
Fish:				
Mexico	119,446	19,304	810,988	140,771
Azores	-	-	25,654	5,672
Rumania	-	-	1,251	11,287
Portugal	-	-	12,125	3,500
Canada	-	-	21,317	16,948
Panama	-	-	7,807	1,312
Costa Rica	-	-	5,576	861
British Honduras ..	4,675	1,134	19,400	4,785
Iran	8,082	84,200	8,082	84,200
Denmark	779	2,287	878	2,548
Other Countries ...	420	140	922	1,252
Total fish	133,402	107,065	914,000	273,136
Shrimp:				
Guatemala	31,573	15,514	261,748	130,817
El Salvador	78,062	48,922	545,174	341,679
Nicaragua	9,984	5,703	989,856	335,861
Costa Rica	171,136	74,407	498,827	213,235
Panama	230,359	143,128	1,653,529	919,396
Venezuela	402,493	213,835	2,884,921	1,557,257
Ecuador	-	-	12,210	3,440
Mexico	-	-	24,748	9,052
Netherlands Antilles	-	-	3,075	2,722
Honduras	25,200	18,588	25,200	18,588
Argentina	10,519	4,864	10,519	4,864
Total shrimp	959,326	524,961	6,909,807	3,536,911
Shellfish other than shrimp:				
Canada	617	234	224,059	91,114
British Honduras ..	29,373	18,728	206,585	121,029
Honduras	26,709	22,724	139,712	103,390
Costa Rica	-	-	1,400	1,247
Panama	-	-	1,040	1,011
Jamaica	-	-	30,014	21,324
Netherlands Antilles	11,883	8,621	43,079	28,477
Venezuela	-	-	22,263	13,624
Mexico	14,421	11,522	68,340	45,095
Guatemala	3,000	1,125	11,470	5,715
Leeward and Wind- ward Islands	1,107	436	24,018	9,096
Nicaragua	-	-	1,186	555
Colombia	-	-	1,763	5,110
Ecuador	-	-	1,640	1,152
El Salvador	5,418	4,128	6,249	4,607
Trinidad	-	-	2,338	971
Dominican Republic.	3,496	3,480	25,575	23,704
Bahamas	15,900	5,710	17,782	6,547
Other Countries ...	672	645	1,151	2,217
Total shellfish (ex- cluding shrimp) ..	112,596	77,353	829,664	485,985
Grand total	1,205,324	709,379	8,653,471	4,296,032
1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.				
2/When the country of origin is not known, the country of shipment is shown.				
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.				
4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.				
Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.				
Source: <i>United States Airborne General Imports of Merchandise</i> , FT 380, October 1962, U. S. Department of Commerce.				

Airborne imports of shellfish other than shrimp in October consisted of 104,493 pounds of spiny lobsters from Caribbean and Central American countries, 617 pounds of northern lobsters from Canada, and 7,486 pounds of crab meat from Mexico and the Dominican Republic. Almost 97 percent of the airborne imports of spiny lobsters entered through the Customs District of Florida; the remainder entered through the Customs District of Puerto Rico.

The leading finfish product imported by air in October was 115,726 pounds of fish fillets (mostly from Mexico) all of which entered through the Customs District of Florida.

The data as issued do not show the state of all products--fresh, frozen or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

* * * * *

EDIBLE FISHERY PRODUCTS, FEBRUARY 1963:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in February 1963 were up 4.6 percent in quantity and 10.4 percent in value from those in the previous month. Imports were much heavier in February for frozen albacore tuna (increase mostly from Japan and Western Africa) and canned sardines not in oil (increase mostly from South Africa Republic). Imports were also up for sea catfish fillets, canned tuna in brine, canned sardines in oil, canned oysters, fresh and frozen lobster and spiny lobster, and frozen frog legs. But there was a noticeable decline in over-all imports of fish fillets, frozen tuna other than albacore, and frozen shrimp.

Compared with the same month in 1962, imports in February 1963 were up 7.9 percent in quantity and 6.9 percent in value. Imports were up this February for frozen tuna (increase mostly from Japan, Western Africa, and Peru), canned sardines not in oil, canned oysters, frozen shrimp, and sea scallops. The increase was partly offset by a decline in imports of fish blocks and slabs, canned sardines in oil, canned salmon, and canned tuna in brine.

In the first 2 months of 1963, imports were up 2.4 percent in quantity but down 3.8 percent in value as compared with the same period in 1962. Although the over-all totals were about the same in both years, there was a great deal of fluctuation in individual import items. There was a large increase in 1963 in imports of frozen tuna other than albacore and canned sardines not in oil. Imports were also up for cod fillets, frozen salmon, frozen shrimp, sea scallops, and frozen frog legs. On the other hand, imports were down sharply for frozen albacore tuna, canned tuna in brine, canned sardines in oil, canned salmon, and flounder fillets.

U. S. Imports and Exports of Edible Fishery Products, February 1963 with Comparisons								
Item	Quantity				Value			
	Feb.		Jan.-Feb.		Feb.		Jan.-Feb.	
	1963	1962	1963	1962	1963	1962	1963	1962
Imports:	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
Fish & Shellfish: Fresh, frozen & processed ^{1/} ..	90.6	84.0	177.2	173.0	30.8	28.8	58.7	61.0
Exports:								
Fish & Shellfish: Processed only ^{1/} (excluding fresh & frozen) ..	4.2	2.9	7.9	6.4	1.3	1.3	2.9	2.7
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.								

Exports of processed fish and shellfish from the United States in February 1963 were up 13.5 percent in quantity but down 18.7 percent in value from those in the previous month. In February, there was a large increase in exports of the lower-priced canned squid and canned sardines not in oil, as well as a modest increase in exports of canned mackerel and canned shrimp. But there was a sharp decline in exports of the higher-priced canned salmon.

Compared with the same month in 1962, exports in February 1963 were up 44.8 percent in quantity, but the value

of exports was the same in both months. Again, the increase in quantity was due mainly to greater exports of canned squid, canned sardines not in oil, and canned mackerel. From a value standpoint, the increase was offset by a decline in exports of canned salmon.

Processed fish and shellfish exports in the first 2 months of 1963 were up 23.4 percent in quantity and 7.4 percent in value from those in the same period of 1962. Exports of the lower-priced canned squid (principally to Greece and the Philippines) showed the greatest increase. Exports were also up for canned salmon, canned sardines not in oil, and canned shrimp. But there was a modest decline in exports of canned mackerel. Although not covered in the table, exports of frozen shrimp were up sharply in the first 2 months of 1963 (increase mostly in exports to Japan).

* * * * *

EXPORT CREDIT INSURANCE, FIRST QUARTER 1963:

Short-Term Export Credit Insurance:
Credit insurance for United States exporters, covering both overseas commercial and political risks, became available on February 5, 1962, through the Foreign Credit Insurance Association (FCIA). In cooperation with the Export-Import Bank of Washington (Eximbank), the FCIA will insure in a single policy both commercial credit and political risks on short term transactions resulting from United States export sales to buyers in friendly foreign countries.



During the first quarter of 1963, FCIA issued 125 new short-term comprehensive policies covering both political and commercial risks on exports on credit terms of up to 180 days. Since the inception of the program, 1,168 such policies have been issued with an aggregate liability of \$499.2 million.

Eximbank's new services and modifications in its insurance and guarantee programs, announced on January 11, 1963, included insurance policies on export transactions to cover political risks alone. Under the short-term insurance program for political risks alone, 12 policies with an aggregate liability of \$12.7 million were issued during January-March 1963.

Medium-Term Guarantees, Insurance and Credits: Medium-term assistance for credits of from 6 months to 5 years is provided United States exporters on one or more of four bases: (1) guarantees by Eximbank to U. S. financial institutions financing exports without recourse on the exporter, (2) export credit insurance from the FCIA, and (3) guarantees to exporters, or (4) non-recourse financing

directly by Eximbank when the first two methods are unavailable.

(1) Medium-term guarantees to or participations with banks: During the quarter, 132 medium-term comprehensive guarantees were issued to, or participations were entered into by Eximbank with 31 commercial banks which provided non-recourse financing for 82 exporters of shipments valued at \$31.6 million to 35 markets abroad. The banks assumed for their own account the commercial risks on the early maturities of these medium-term credits.

(2) Medium-term export credit insurance: During the reporting period, FCIA in partnership with Eximbank issued 98 medium-term comprehensive export credit insurance policies to 66 exporters covering shipments valued at \$6.9 million to buyers in 22 markets overseas. A total of 195 such policies have been issued since inception of this program on July 16, 1962.

Under the new medium-term insurance program announced in January 1963 to cover political risk alone, 3 policies were issued to 3 U. S. exporters covering shipments valued at \$237,120 to buyers in 3 markets abroad.

(3) Guarantees to exporters: None issued during the quarter.

(4) Non-recourse financing directly by Eximbank: During the first quarter of 1963, 11 participations with commercial banks and exporters were authorized for a total of \$1.8 million on shipments with an export value of \$4.2 million. (Eximbank Reports, January-March 1963.)

* * * * *

IMPORTS OF FISH MEAL UP SHARPLY IN MARCH 1963:

The March 1963 imports of fish meal by the United States were more than double the average for the month established in 1960-1962. During the first quarter of 1963, U. S. imports of fish meal were 69.6 percent greater than in the same period of the previous year.

Peru supplied 41,120 short tons or 85.9 percent of the United States fish-meal imports in March 1963 and 87,751 short tons or 82.4 percent of the imports in January-March 1963.

U. S. Imports of Fish Meal, First Quarters of 1960-1963		
Year	March	Jan.-Mar.
	(Short Tons)	
1963 1/2	47,895	106,476
1962	18,528	62,774
1961	20,458	44,333
1960	18,652	35,304

1/Preliminary.

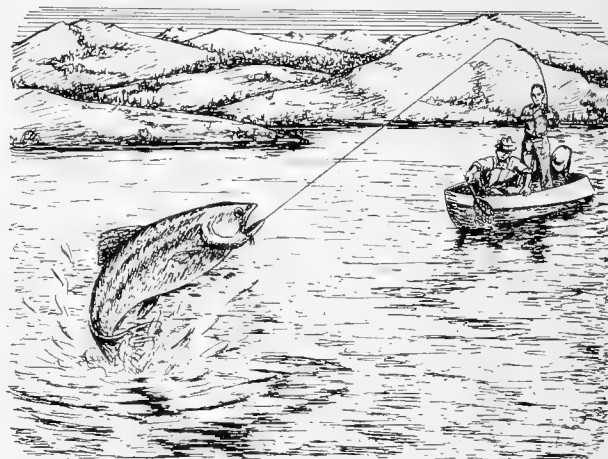
Source: U. S. Bureau of the Census.



Washington

SALMON CATCHES BY SPORTS FISHERMEN GOOD IN 1962:

Catches of salmon by sports fishermen in Washington State during 1962 were good, highlighted by record catches of silver salmon off Westport and the mouth of the Columbia River. Estimates of the State's Department



of Fisheries places the total statewide catch at 598,590 salmon, not including fresh water catches, where insufficient data is available to form catch estimates.

The estimated number of angler trips set a new record of 1,130,717, an increase of nearly 100,000 over 1961.

Silver salmon were available in good numbers from the early-season on--and treated anglers to consistently good fishing. The greatest disappointment of the year occurred in the Strait of Juan de Fuca where chinook salmon catches slumped even lower than in 1960. The silver catch in the Strait, depending chiefly upon the location of schools of feeding fish, was likewise poor. Only those anglers fishing west of Cape Flattery were able to take silvers regularly and this the Neah Bay charter boat anglers did with fine results.

The take of silver salmon at Westport totaled 143,000, more than twice as large as in 1961, with chinook catches of 50,000 the best in the past five years. The silver catch at the mouth of the Columbia totaled 115,900, and chinooks 29,600, for an over-all season average of 1.22 salmon per angler trip. The average at Westport was even better (1.47).

Puget Sound catches were rather ordinary in the light of catches for recent years, but chinook catches rose sharply in November and December 1962. Good survival of the 1960 brood year of chinook, along with favorable weather, appeared to be the primary causes for the late season surge. Total catch in Puget Sound was 193,160 salmon, not large when compared to the 778,755 angler trips for the year.

The oddity of the 1962 season was the unprecedented sport catch of even year pink salmon at Westport and Neah Bay--1,400 at

Westport, 430 at Neah Bay. These fish, usually taken in insignificant quantity during even years, may have been part of the tremendous Bella Coola 1962 run.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, APRIL 1963:

Seasonal increases in landings resulting in lower ex-vest prices for fresh drawn haddock, and lower wholesale prices for fresh and frozen haddock fillets, halibut, and salmon, were largely responsible for the 3.2-percent decline between March and April this year in the wholesale price index for edible fishery products (fresh, frozen, and canned). Compared with the same month a year ago, the wholesale price index this April at 113.6 was 4.5 percent lower due to sharply lower prices in the subgroup indexes for drawn, dressed, or whole finfish, and canned fishery products.

Substantially heavier fish landings at New England ports, principally haddock, together with price declines for other

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, April 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Apr. 1963	Mar. 1963	Apr. 1963	Mar. 1963	Feb. 1963	Apr. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					113.6	117.3	118.4	118.9
Fresh & Frozen Fishery Products:					117.7	123.0	124.4	117.2
Drawn, Dressed, or Whole Finfish:					106.6	121.2	122.7	119.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.12	62.5	91.9	94.6	91.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.41	118.3	122.2	125.6	133.1
Salmon, king, lge., & med., drsd., fresh or froz.	New York	lb.	.88	.95	122.3	132.7	133.8	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.70	.68	104.5	100.7	100.7	126.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.42	.69	68.8	113.0	113.0	139.2
Processed, Fresh (Fish & Shellfish):					127.7	125.5	128.5	120.4
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.32	.39	76.5	94.7	98.3	91.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.10	1.07	128.9	125.4	130.7	116.0
Oysters, shucked, standards	Norfolk	gal.	8.00	7.75	134.9	130.7	130.7	130.7
Processed, Frozen (Fish & Shellfish):					114.4	117.3	117.3	108.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	97.6	97.6	98.9	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.34	.37	99.7	108.5	108.5	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.34	117.5	117.5	115.7	115.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.04	1.04	122.8	123.4	123.4	112.7
Canned Fishery Products:					106.8	107.7	108.0	122.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.25	24.75	105.7	107.9	107.9	124.2
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.90	5.90	2/100.0	2/100.0	2/100.0	118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.06	9.06	116.2	116.2	119.4	164.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced in the fishery products index by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/Based on Calif. sardines and not directly comparable with new subgroup item (jack mackerel) for January-March 1963.

products in the drawn, dressed, or whole finfish subgroup were responsible for a 12.0-percent drop in the index from March to April 1963. Compared with April 1962, the subgroup index this April dropped 10.5 percent because of lower prices for all items except fresh or frozen salmon at New York. From March to April this year, the ex-vessel price for fresh drawn haddock at Boston dropped 32.0 percent. Prices this April also were lower at New York for fresh or frozen dressed halibut (down 3.2 percent), salmon (down 7.8 percent), and yellow pike (down 39.1 percent).

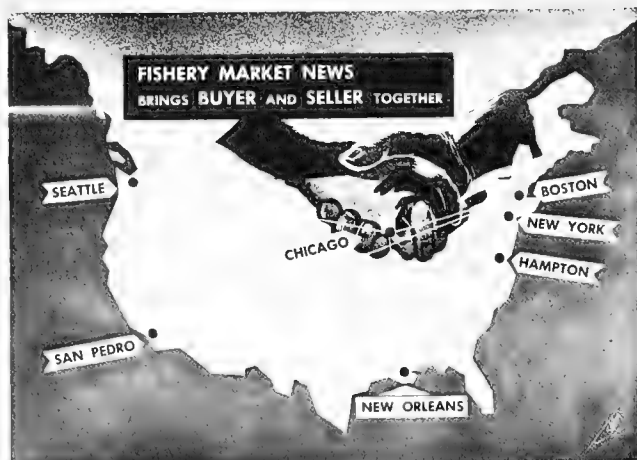


Processing fillets at a New England plant.

Prices for processed fresh fish and shellfish decreased 1.8 percent from March to April this year. Seasonally heavier supplies resulted in a 19.2-percent drop in the price of fresh haddock fillets at Boston, but prices were higher at New York for fresh shrimp (up 2.8 percent), and prices for fresh shucked oysters this April increased 3.2 percent because of limited supplies. Compared with the same month a year earlier, the subgroup price index this April was up 6.1 percent. Lower prices for fresh haddock fillets this April as compared with the same month in 1962 were offset by higher prices for fresh shrimp and shucked oysters.

The April 1963 processed frozen fish and shellfish subgroup price index was down 2.5 percent from the previous month, but rose 5.9 percent from the same month of 1962. The lower subgroup index from March to April was principally due to lower prices for frozen haddock fillets (down 8.1 percent) although a slight price drop for frozen shrimp (down 0.5 percent) at Chicago also occurred. As compared with the same month a year ago, prices this April advanced for all products except frozen flounder fillets which were lower by 2.5 percent.

The canned fishery products subgroup index at 106.8 percent of the 1957-59 average dropped 0.8 percent from March to April 1963. Most of the canned fish products remained at the March price level but canned pink salmon prices (down 2.0 percent) dropped for the first time since the beginning of the year. Compared with the same month a year ago, the subgroup index this April was lower by 12.5 percent. Stocks from the 1962 canned pack of Maine sardines and Pacific salmon were liberal this April and prices for some items were sharply lower--canned Maine sardines (down 29.3 percent) and canned pink salmon (down 14.9 percent). In addition, canned tuna was lower by 3.2 percent due to unsettled market conditions.



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FOREIGN

International

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY 1963:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Production and Exports of Fish Meal by Member Countries of the Fish Meal Exporters' Organization, January 1963				
Country	January 1963		Jan.-Dec. 1962	
	Production	Exports	Production	Exports
	..... (Metric Tons)			
Angola	2,596	2,893	32,758	32,558
Iceland	9,476	9,121	96,147	70,931
Norway	3,659	8,187	120,927	61,690
Peru	145,659	147,236	1,120,796	1,065,952
South Africa (incl. S. W. Africa)	9,800	6,755	201,219	192,931
Total	171,190	174,192	1,571,847	1,424,062

In January 1963, Peru accounted for 84.5 percent of total fish meal exports by FEO countries, followed by Iceland with 5.2 percent, Norway with 4.7 percent, South Africa with 3.9 percent, and Angola with 1.7 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, April 5, 1963.)

FOOD AND AGRICULTURE ORGANIZATION

FISHERIES INCLUDED IN AGENDA OF WORLD FOOD CONGRESS:

The United States Congress, in Public Law 87-841 of October 18, 1962, authorized the United States to host the Food and Agriculture Organization's (FAO) World Food Congress in Washington, D.C., June 4-18, 1963. This will be a major event in FAO's worldwide Freedom From Hunger Campaign and will highlight present and future world food problems. A ceremony will also be held to commemorate the founding of FAO at Hot Springs, Virginia, in 1943. The United States will issue a joint Freedom From Hunger/Food for Peace commemorative stamp in June 1963 to coincide with the World Food Congress opening.

The President of the United States has appointed the trustees of the American Freedom From Hunger Foundation to serve as a Citizen's Host Committee for the World Food Congress. The Host Committee will work with a Government Committee on arrangements for the delegates who will be attending the Conference. The Citizen's Host Committee has four principal subcommittees. One is a Travel and Fellowship Subcommittee which plans to raise funds to assist in financing the travel and attendance of representatives from developing countries who otherwise would not be able to participate. Another is the Tours and Plant Visit Subcom-

mittee (nonfund raising) to arrange for tours and visits to agricultural, forestry, and fisheries areas, and private industrial plants. A third is the Communications Subcommittee to work on preconference publicity within the United States. The fourth is a Hospitality Subcommittee to meet incoming delegates and assist them during the Congress.

The World Food Congress is scheduled to open with the usual Plenary Session and is divided into four Commissions: (1) Technical Commission; (2) Economic and Social Commission; (3) Education and Research Commission; and (4) Commission for People's Involvement and Group Action.

Fisheries will be given consideration by each of those Commissions. One of the major items, for example, on the agenda for the Technical Commission will be "Nutritive Diets for Poorly Fed Peoples." This agenda item on nutrition is further divided into: (1) Animal and poultry production; (2) Fisheries; and (3) Cultivation of legumes, fruits, and vegetables.

Guidelines given for the agenda subitem on fisheries are as follows:

"The development of fishery resources and production assumes a special significance in the context of increasing pressure on land. The collection and dissemination of oceanographic and biological data and the steps to be taken for it are important in this connection. Inland possibilities form a separate study. Possible levels of yield with improved techniques and combination with other land uses have to be studied. The combination of fish-farming with irrigated agriculture is an example. The transport of sea food to inland areas raises many technical and economic problems."

INTER-AMERICAN TROPICAL TUNA COMMISSION

LOWER QUOTA FOR YELLOWFIN TUNA CAUGHT IN EASTERN PACIFIC PROPOSED:

The Inter-American Tropical Tuna Commission (United States, Costa Rica, Ecuador, and Panama) at the April 16-17, 1963 meeting held in Panama, Republic of Panama, closed its session with the following Resolution:

Having reviewed its previous findings and recommendations respecting the need to curtail the catch and effort for yellowfin tuna in the Eastern Pacific Ocean, in order to restore the population of that species to a level where maximum sustainable catches may be again obtained,

Having considered the additional statistics of catch and effort, and other information for the year 1962, and

Observing that the studies of its scientific staff indicate that the yellowfin population remains substantially below the level of abundance corresponding to maximum sustainable yield, that a prudent estimate of the sustainable yield to be expected during 1963 is that it will not exceed 81,000 short tons.

Recommends to the High Contracting Parties that they take joint action as follows:

International (Contd.):

(1) Establishment of a catch-limit (quota) on the total catch of yellowfin tuna by fishermen of all nations of 81,000 tons during calendar year 1963, from the area previously defined in the Resolution adopted by the Commission on May 17, 1962.

(2) Reservation of 2,000 tons of this yellowfin tuna quota for allowance for incidental catches when fishing for other species, such as skipjack and big-eye tuna, after the closure of unrestricted fishing for yellowfin tuna.

(3) Opening of the fishery for yellowfin tuna on January 1, 1963; during the open season vessels should be permitted to depart from port with permission to fish for any tuna species, including yellowfin, without restriction on the quantity of any species, until the return of the vessel to port.

(4) Closure of the fishery for yellowfin tuna during 1963 at such date as the quantity of tuna already landed plus the expected catch of yellowfin tuna by vessels which are at sea with permits to fish without restriction reaches 79,000 tons.

(5) After the date of closure of the fishery for yellowfin tuna, vessels should be permitted to leave port with permission to fish only for other species of tuna than yellowfin tuna; but any vessel operating under such permission should be allowed to land not more than 15 percent by weight of yellowfin tuna among its catch on any voyage. This limitation should apply to each and every trip on which the vessels depart with permission to fish only for other species of tuna than yellowfin tuna, even though the vessel does not return to port from such a trip until after the end of the calendar year 1963.

(6) Such action as may be necessary to obtain the cooperation of those Governments whose vessels operate in this fishery, but which are not parties to the Convention for the Establishment of an Inter-American Tropical Tuna Commission, in effecting these conservation measures.

At the May 1962 meeting of the Commission held in Quito, Ecuador, an over-all quota for the Eastern Pacific area extending off the coast of North and South America between Eureka, Calif., and 30° S. latitude, a catch quota of 83,000 short tons was recommended.

INTERNATIONAL COOPERATIVE INVESTIGATION OF THE TROPICAL ATLANTIC

GUINEAN TRAWLING SURVEY:

The International Cooperative Investigations of the Tropical Atlantic (ICITA) will include a trawling survey in the Gulf of Guinea to assess the qualitative and quantitative composition of exploitable fish stocks. This phase of ICITA will be directed by the Commission for Technical Cooperation in Africa, South of the Sahara (CCTA/CSA).

The first meeting of the Scientific Committee for the Guinean Trawling Survey was held in Lagos, Nigeria, on March 18-19, 1963. At that time, the Committee announced plans for the survey as follows:

The survey will be divided into two operational phases: Guinean I (August 15-December 15, 1963) and Guinean II (February 15-

June 15, 1964). The timing of the campaign has been designed as near as possible to coincide with the hydrographic seasons in the area.

The northern boundary of the survey area will be Cape Roxo, Portuguese Guinea, and the southern boundary will be the mouth of the Congo River.

The survey will be conducted on two chartered French vessels. Both vessels are side trawlers, about 35 meters (115 feet) in length, with main engines developing 600 horsepower.

A transect interval of 40 miles will be used in exploratory fishing operations. Within each transect, 8 stations will be occupied at depth intervals up to 110 fathoms. When possible, trawling will also be attempted between 220 and 330 fathoms. Hydrographic observations will be taken during the survey.

The Scientific Committee for the Guinean Trawling Survey plans to hold its next meeting in Abidjan, Ivory Coast, during March 1964.

Note: See Commercial Fisheries Review, November 1962 p. 59, August 1962 p. 56, and June 1962 p. 33.

NORTH PACIFIC FISHERIES CONVENTION

JAPANESE VIEWS ON REVISION OF CONVENTION:

On April 15, 1963, an authoritative Japanese economic daily carried the following report on preparation by Japanese Governmental agencies for talks on revision of the International North Pacific Fisheries Convention.

"The Ministry of Agriculture and Forestry and Fishery Agency will begin full scale study this week on the problem of revising the Japan-United States-Canada Fishery Treaty which is scheduled to expire in June. From the standpoint of freedom of the high seas and fair distribution of resources in the high seas, Japan will argue for a fundamental revision of this treaty and strongly ask for the abolition or relaxation of 'voluntary restrictions' (virtually a ban) on Japanese fishing for North American salmon, halibut in the Gulf of Alaska, and Canadian herring. Contrarywise the United States and Canada intend that the existing treaty be extended without modification. With the commencement of negotiations close at hand, the countries concerned are actively preparing for the conference. President Kennedy has already announced that the United States 'cannot allow voluntary restrictions be relaxed.' It would appear, therefore, there is the great likelihood that negotiations will have hard sailing and turn into a big political issue.

"The fisheries negotiations are to be started in early June, either in Washington or Tokyo. Japan is scheduled to appoint Ambassador Takeuchi of the Japanese Embassy, Washington, as head of the delegation assisted by Director of Fishery Agency Shono and other advisors and experts.

"The Japanese Government regards the abolition or relaxation of voluntary restrictions its principal objective in the forthcoming negotiations. Minister of Agriculture and Forestry Shigemasa has announced during the current Diet session that the Government will endeavor to meet this objective. Japan will press for the abolition or relaxation of voluntary restrictions because:

International (Contd.):

"(1) In the expansion of Japanese salmon mothership fisheries, catches have increased over pre-war days. As a result of this expansion, it has become possible for Japanese motherships to catch a considerable amount of red salmon of Bristol Bay origin. This situation was not anticipated at the time of the signing of the present treaty.

"(2) The present treaty banned salmon fisheries on the high seas east of 175 degrees west longitude. Later it became clear that North American salmon were distributed over a far greater area than was expected at the time of the conclusion of the treaty.

"The biggest question is the extent of intermingling of Asian and North American salmon. The result of joint research conducted by the three countries reveals that the western limit of distribution of North American salmon (red salmon) is at about 168 degrees east longitude and the western limit of distribution of Asian salmon (chum salmon) is 153 degrees west longitude or east thereof. Thus the scope of movement of these two species of salmon extends from the seas off Kamchatka to the Gulf of Alaska. As a matter of fact, Japan is catching red salmon of North American origin in Area A, an area established by the Japan-Soviet Fisheries Convention and described as waters north of 45 degrees north latitude and west 175 degrees west longitude. According to United States data, 15 million red salmon moved into this area in 1962 and Japan caught a considerable portion (about 20%) of these fish. If such is the case, voluntary restrictions provided for in the tripartite treaty involve contradictions.

"Japan recognizes that the present treaty has been an asset for the stabilization of North Pacific fisheries during the past decade. Japan holds, however, that voluntary restrictions have lost their significance both in theory and in practice and therefore must be repealed or relaxed. The United States on the other hand contends that the red salmon resource has a great bearing on the economic development of Alaska and the Pacific Northwest States and that by conservation practices has endeavored to maintain the resources. The United States maintains that if Japan is allowed to fish for red salmon on the high seas with fishing gear and methods alien to United States nationals, conservation measures which the United States has had in effect for many years will be nullified in a brief space of time. It is anticipated, therefore, that the United States and Canada may propose that the provisional abstention line located at 175 degrees west longitude be moved west by about five degrees to protect salmon of North American origin.

"(3) The principle of voluntary restriction which Japan accepted under the present convention has never gained international recognition. The United States made every effort to have the principle accepted as part of international law, first at the Rome Conference in 1955, then at the meeting of the International Law Committee in 1956, and finally at the Law of the Sea Conference in 1958. At all of these conferences, the American proposal was defeated because of opposition raised by advanced fishing countries.

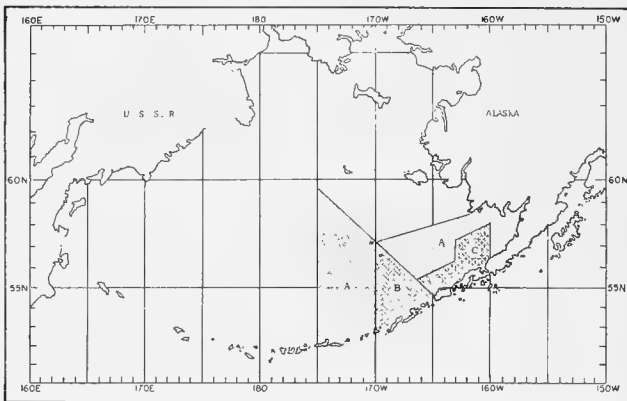
"For many years, Japan has been endeavoring to eliminate the principle of abstention from the convention. So far, however, only abstention of fishing for herring, and halibut in the Eastern Bering Sea has been lifted. It is expected that Japan will meet strong resistance from the United States and Canada in its attempt to abolish restrictions on fishing for red salmon since red salmon are considered the most important resource of the two countries. In the United States there is growing opinion in congressional and Pacific Coast fisheries circles that the present United States-Canada-Japan Fisheries Convention should be modified to include the Soviet Union in order to curb the activities of the U.S.S.R. in the North Pacific fisheries. Also, such action would enable the United States and the Soviet Union to act in concert to assert greater pressure upon Japan's offshore fisheries." (United States Embassy, Tokyo, April 23, 1963.)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

JAPAN GAINS NEW HALIBUT AND HERRING FISHING GROUNDS IN EASTERN PACIFIC:

On May 8, 1963, the Canadian Government announced approval of recommendations to give Japanese fishermen the same rights as fishermen of the United States and Canada to fish for halibut in the waters of the eastern Bering Sea. The recommendations were made in November 1962 by the International North Pacific Fisheries Commission, whose members represent Canada, Japan, and the United States. Since the Governments of Japan and the United States had already approved the Commission's recommendations, they took effect as of May 8.

Although this action opened the halibut stocks of the eastern Bering Sea to certain types of Japanese fishing gear, the Japanese are barred from keeping any halibut taken in those areas which still come under the abstention provisions of the North Pacific Treaty. In addition, the new Bering Sea halibut regulations included the conservation arrangements approved at the Commission's interim meeting in Tokyo in February 1963. Those joint conservation measures are particularly significant in respect to the heavily fished "Triangle Area" where a total 1963 catch quota of 11 million pounds was agreed upon.



Bering Sea halibut conservation areas, 1963. No retention of halibut by trawlers in Areas A and B. No trawling in Area C. Halibut quota 11,000,000 pounds in Area B, using longlines only.

Other conservation measures include a minimum halibut size limit of 26 inches or a minimum weight of 5 pounds. Only long-line gear may be used to take halibut in a very large portion of the eastern Bering Sea. Japanese

International (Contd.):

trawlers which catch bottomfish in the region may not retain any halibut taken in their nets in areas "A" and "B" (chart). In addition, trawling is completely prohibited in a large area north of the Alaska Peninsula where young halibut are found.

The Commission has established a program of research for the groundfish stocks of the Bering Sea on behalf of Canada, Japan, and the United States. Data on all bottom-fishing operations in the entire Bering Sea by the three countries flow to Commission headquarters for study and for use in preparation of conservation recommendations for future years. Requests have been made to the Soviet Union for similar data from their fishing fleets in the region.

Japanese vessels also gained the right to fish for herring outside of Canadian territorial waters off the west coast of the Queen Charlotte Islands. The recent approval of the Commission's recommendations placed those herring stocks in the same category as stocks of herring off Alaska, which have been accessible to Japanese fishermen since 1960.

Removal of the herring stock off the west coast of the Queen Charlotte Islands from abstention does not necessarily mean that Japanese fishermen will come to the area to fish for herring. Although herring on the high seas off Alaska's coast have been legally accessible to Japanese fishermen since May 24, 1960, only one Japanese fleet has attempted a herring fishery, with no success.

The Commission has prepared plans for joint research and observation which will go into effect in case any multi-nation herring fishery develops in waters formerly under abstention. Data will be collected which will enable the Commission to measure the progress of the fishery, the effect on other species, and conservation requirements. (International North Pacific Fisheries Commission, Vancouver, May 9, 1963.)

Note: See Commercial Fisheries Review, March 1963 p. 42.

NORTHWEST ATLANTIC FISHERIES COMMISSION

BOTTOMFISH SPAWNING AND DEVELOPMENT IN NORTH ATLANTIC TO BE STUDIED:

France, Scotland, England, Norway, Denmark, the Soviet Union, West Germany, Can-

ada, and Iceland plan to participate in a research expedition to study the drift of fish eggs, such as cod, and the habits and development of the fry produced by ocean perch in the North Atlantic. The main area of study will be between Iceland and Greenland, near Western Greenland, and near Newfoundland. Twelve vessels were to be used in the study which will be coordinated by the International Northwest Atlantic Fisheries Commission. The survey was scheduled to begin in June 1963. (United States Embassy, Reykjavik, April 5, 1963.)

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

JAPAN AND U.S.S.R. REACH AGREEMENT ON NORTHWEST PACIFIC SALMON CATCH QUOTAS:

On April 4, 1963, the International Northwest Pacific Fisheries Commission (Japan-U.S.S.R.) reached an agreement on Japan's salmon quota for 1963. The over-all quota for Areas A and B was set at 120,000 metric tons. Area A includes the waters to the north of 45° N. latitude (present treaty waters) and Area B the waters to the south of 45° N. latitude. The following regulations will apply to the two areas in 1963:

Quotas: Area A -- 57,000 metric tons, an increase of 2,000 tons or 3.6 percent over the 1962 quota of 55,000 tons. Area B -- 63,000 metric tons, an increase of 3,000 tons or 5 percent more than the 1962 quota of 60,000 tons.

The 11 salmon motherships and 369 catcher vessels permitted to operate in the North Pacific salmon fishery in 1963 are unchanged from 1962.

The Soviet Union and Japan on March 4, also reached an agreement on the 1963 Okhotsk Sea king crab production quota -- 630,000 cases (48 6.5-oz. cans) of which the Soviet Union's share is 252,000 cases and Japan's share 378,000 cases.

Items remaining for the Commission's consideration on March 4 were: (1) 1964 salmon catch quotas; (2) enforcement of regulations in Area B; and (3) exchange of scientists.

SWEDISH-NORWEGIAN SHRIMP FISHING AGREEMENT EXTENDED THROUGH 1964

Representatives of Norway and Sweden proposed in early 1963 to terminate the Nor-

International (Contd.):

wegian-Swedish shrimp fishing agreement after a transition period of two years. The Norwegian Parliament on March 28, 1963, approved the proposed 2-year respite for Swedish shrimp fishermen.

The original agreement signed in 1950 had given Swedish shrimp fishermen the right to fish in a specified deep-water area (about 4 nautical miles wide and 17 miles long) in Oslo Fjord until January 1, 1956. Although small, the area is an exceptionally rich fishing ground. Norwegian fishermen were correspondingly permitted to fish in certain areas off the west coast of Sweden. The agreement was to be automatically renewed each year thereafter if neither country gave notice of cancellation.

On June 15, 1962, the Norwegian Government, pressed by domestic fishing organizations, decided to terminate the shrimp fishing agreement as of January 1, 1963. Negotiations between the Swedish and Norwegian Governments, however, resulted in the proposal to continue the fishing rights under the agreement until the end of 1964.

In explaining the actions of their government, Norwegian representatives said that the area within the Norwegian fisheries boundary affected by the agreement is of greatest importance to the Norwegian fishermen in Oslo Fjord, while the compensation area off the Swedish west coast is of only small importance to Norway. It is thought that Swedish fishermen were granted the 2-year transition period because of Norway's need for Swedish support for various policies within the European Free Trade Association (EFTA).

Neither Swedish nor Norwegian fishermen were satisfied with the termination arrangements. Norwegian shrimp fishermen had pressed for immediate cancellation of Swedish fishing rights in the area. On the other hand, the Swedish fishermen who have operated in the area will be subject to the economic strain of adapting their vessels to new conditions.

At present, there are approximately 1,000 Swedish fishermen with about 300 vessels engaged in shrimp fishing. Their total shrimp landings were valued at Kr.18.5 million (US\$3,570,000) in 1961. About 200 Swed-

ish fishermen with some 70 vessels are affected by the new proposals, and the value of their shrimp landings has been Kr. 7-8 million (\$1,351,000-\$1,544,000) annually. The vessels used by those fishermen are between 40 and 48 feet long and are valued at about Kr. 100,000 (\$19,297) each. In order to continue shrimp fishing, the fishermen involved must move to more distant waters requiring vessels of about 60 feet in length and costing Kr. 350,000-400,000 (\$67,541-\$77,190) per vessel. Since there is no market for the old vessels, each replacement will require a large investment in the transition period.

It has been mentioned in Sweden that within the scope of the Scandinavian cooperation it would be possible to make the waters of the Skagerrak-Kattegat a fisheries inland sea for fishermen of Denmark, Norway, and Sweden. Furthermore, if a common Scandinavian market would be gained through the EFTA, all fishermen from participating countries might have equal fishing rights in the area. (United States Consulate, Goteborg, March 28, 1963, and United States Embassy, Oslo, April 9, 1963.)

Note: Swedish kronor 5.182 equals US\$1.00.

EUROPE

WEST EUROPEAN FISHERY
CONFERENCE TO MEET IN ESBJERG:

The West European Fishery Conference will meet in Esbjerg, Denmark, on September 11-12, 1963, according to present plans. The organization is made up of fishing industry representatives from various West European countries who meet annually to discuss fisheries problems. The last meeting, which was held in Goteborg, Sweden, on September 8, 1962, was attended by 42 delegates. Between 60 and 70 delegates are expected to attend the Esbjerg meeting from Norway, Sweden, the United Kingdom, West Germany, The Netherlands, Belgium, France, Spain, Portugal and Denmark. The agenda for the Conference was to be prepared at a meeting of the secretariat and representative delegates in Copenhagen during June 1963. (United States Embassy, Copenhagen, May 1, 1963.)

Note: See Commercial Fisheries Review, December 1962 p. 56.



Aden Protectorate

MUKALLA IS CENTER OF FISHERIES DEVELOPMENTS:

An officer of the United States Consulate in Aden late in February 1963 visited the City of Mukalla which is the capital of Quai'ti State (the paramount Sultanate of the Eastern Aden Protectorate) and the second largest city of the entire Aden Protectorate. His visit is of some interest to the United States fishing industry because of recent developments toward establishing fisheries and processing facilities in Aden for both tuna and spiny lobster. He describes the Mukalla city area as follows:

Fronting directly on the Indian Ocean and backed by a 1,000-foot rock hill, Mukalla is long and narrow with entrances only to the east and west along the coast. Toward the eastern end of the town is a point jutting out into the sea which contains the customs pier (the only pier), the Secretariat (housing the Administration of the Quai'ti Sultanate), the Eastern Bank, the trading companies, and miscellaneous residences. A mile or so to the east along a road which clings to a sheer cliff is the office of the Deputy Fisheries Officer. The fishing vessel yards, the fish-drying areas, and the wholesale fish market are concentrated there.

There is some evidence that modernization of the Eastern Aden Protectorate fishing industry will some day take place in that area. A New York City firm is putting in a small sharp freezer for spiny lobster and the British Commonwealth Development Fund is building a large freezer and cold-storage plant for tuna. (United States Consul, Aden, March 30, 1963.)



Angola

FISHERIES TRENDS IN MOCAMEDES AREA, 1962:

In its report the 1962, Mocamedes Fishing Industry Guild comments on the problems besetting the various products processed by the Mocamedes industry during 1962. Dried fish production, for example, was limited during the year by a severe lack of warehousing. Steps to alleviate this problem are being taken, says the report, by the Angolan Fishing Industry Institute which has purchased a site for extensive warehouse facilities

in Mocamedes which are expected to be in construction during the current year. Fish meal and oil production, says the report, was severely curtailed by the over-all scarcity of fish in the Mocamedes area as well as by the high cost of Diesel fuel and jute bags. The Guild, claims the report, has devoted considerable effort to obtaining a reduced price for Diesel fuel used by the industry. So far, their efforts in this respect have been unsuccessful. The Guild has also been unsuccessful in obtaining licenses for importing Pakistan jute sacking which is 95 percent cheaper than the local protected industry product. Canned fish output, principally tuna, was limited by the organization of the canning industry which, in the Mocamedes area, consists of 9 small units operating at the "artisan" level. What is needed, states the Guild report, are additional credit facilities provided by the State to permit the canning industry to reorganize and re-equip. Also to enable it to overcome its current dependency on the credit facilities provided by local distributors who supply materials on credit at very high prices and purchase the output of the canning industry at lower than world prices for export. Commenting on the technology of the local industry, the report noted that the limitation on the activity of the fishing fleet brought about by the lack of such equipment as electronic fish-finding devices, refrigerated holds, etc., results in a sporadic supply of fish and, on the part of processing facilities, short uneconomical periods of operation interspersed with long periods of inactivity. The report closed with the following comments on the nature of State aid so far received by the Mocamedes industry:

"The problems of the Angolan fishing industry and particularly that of the District of Mocamedes reside fundamentally in the sector of production and not in the sector of marketing. . . . Giving primacy to marketing which ought to be considered secondary has given the industry a low index of productivity. Along with it is an. . . anachronous fiscal system has not permitted the industry to capitalize sufficiently in order to renovate itself and to evolve more rational forms of exploitation. . . . If we add to this an absolute lack of technical assistance and orientation we will have explained in a few words the actual structure; aggravated, undoubtedly, by an excessive individualism common to most Portuguese. . . . The so-called technicians who have come here at the order and expense of the State to analyze and resolve the problems of the fishing industry have not viewed the problem from this angle. Instead of studying and resolving

Angola (Contd.):

the problems of production in accordance with the realities constituted. . . by industrial concentration. . . , they gave priority to the problems of marketing. . . . Precious, irrecoverable time was lost without doing anything with regard to industrial reorganization. The fishing industries are fully aware of their needs and know perfectly well the indispensable measures for the solution of their problems. . . the help of the State, the only entity capable of supplying the necessary means, is indispensable." (United States Consul, Luan-da, April 18, 1963.)

**Australia****OCEANOGRAPHIC DATA CENTER TO BE ESTABLISHED:**

Approval to establish an Oceanographic Data Center has been received by the Australian Hydrographic Office. The Hydrographic Office plans to begin organizing the Data Center in July 1963 and have electronic data processing equipment in use by 1966. (U. S. National Oceanographic Data Center, Newsletter, March 31, 1963.)

**Brazil****NEW FISHERY COOPERATIVE FORMED IN PARANA STATE:**

In mid-February 1963, the newly formed Parana Coastal Fishermen's Cooperative began supplying fishery products to Curitiba. As a result, fish prices in the city dropped by an average of 35 percent. The Cooperative maintains a 10-ton cold-storage warehouse in Curitiba. The Parana State Bank and CODEPAR (the State's economic development and investment company) are giving advice and assistance to the Cooperative, which presently consists of approximately 2,400 fishing enterprises and individual fishermen. (United States Consulate, Curitiba, March 19, 1963.)

**Canada****BRITISH COLUMBIA ADOPTS RESOLUTIONS ON TERRITORIAL WATERS AND FISHERIES CONVENTION AMENDMENTS:**

A report filed in the British Columbia Legislative Assembly by the Special Committee on Fisheries recommended to the Assembly that ratification of amendments to the North Pacific Fisheries Convention be delayed and that a twelve-mile fisheries limit be established. The report was approved by the Assembly on March 26, 1963, and resolutions on both subjects have been forwarded to the Government of Canada in Ottawa for consideration.

The Report of the Special Committee appointed to examine and inquire into certain matters affecting the commercial fishing industry in British Columbia, and the resolutions adopted by the Legislation follow:

Your Special Committee appointed to examine and inquire into certain matters affecting the commercial fishing industry in British Columbia begs leave to report as follows:

Your Committee held five meetings and heard submissions from individuals representing the following organizations: The United Fishermen's and Allied Workers' Union; the British Columbia Federation of Labor; the Fisheries Association of British Columbia; the Pacific Trollers' Association; the Amalgamated Conservation Society; and the British Columbia Federation of Fish and Game Clubs.

Your Committee noted a broad difference in viewpoints between various sections of the commercial fishing industry respecting ratification of certain amendments to the International North Pacific Fisheries Convention. Nevertheless, all sections of the industry expressed grave doubt that commercial fishing on the high seas was in the best interests of proper conservation, and the principle of sustained annual productivity. It was also noted that all countries had a vested interest in those fish originating within their respective territorial boundaries, which accounted for the extensive research and conservation programmes being carried out by each of the participating nations.

Your Committee noted further that a lack of research data precluded an intelligent appraisal of the future effect of a her-ring fishery off the west coast of the Queen Charlotte Islands.

In view of these circumstances your Committee recommends that the following resolution be forwarded to the Government of Canada:

Whereas a Special Committee of the British Columbia Legislature was appointed to examine and inquire into certain matters affecting the commercial fishing industry and those employed therein; and

Whereas that Committee subsequently met with principal organizations representative of that industry; and

Whereas there was general agreement among submissions made to the Committee that serious doubt existed that a wholesale commercial fishery on the high seas was in the best interests of proper conservation and the principle of sustained annual productivity; and

Whereas extensive research and conservation programmes were being carried out by each of the participating na-

Canada (Contd.):

tions of the convention, particularly concerning those fish in which the respective countries had a vested interest as originating within their respective territorial boundaries; but

Whereas no research data was available from which to form an opinion as to the effect of a future Japanese herring fishery off the west coast of the Queen Charlotte Islands on immature salmon stocks;

Therefore Be It Resolved That the Government of Canada give consideration to receiving representations from all segments of the British Columbia fishing industry prior to the ratification of amendments to the convention now under study; and

Be It Further Resolved, That an immediate research programme be instituted to ascertain the future effect of a Japanese herring fishery off the west coast of the Queen Charlotte Islands on British Columbia herring quotas and immature salmon stocks.

Your Committee also noted basic agreement by all segments of the industry with the pressing need to amend the now obsolete three-mile limitation of Canada's territorial waters. All submissions advocated a straight baseline drawn from headland to headland of British Columbia's outer coastline, and to provide protection for Canadian fisheries for a distance of twelve miles to seaward in support of the arguments offered. As a result thereof your Committee further recommends that another resolution containing this request be forwarded to the Government of Canada, as follows:

Whereas precedent exists whereby nations have established the width of their territorial seas; and

Whereas the present three-mile limit is inadequate for the protection of Canadian fisheries;

Therefore Be It Resolved, That Canada take unilateral action to establish a headland to headland baseline along its outer coastal shoreline as recommended jointly by Canada and the United States of America at the 1960 United Nations Conference on the Law of the Sea; and

Be It Further Resolved, That Canada, while recognizing reciprocal fishing rights with the United States of America, declare exclusive fishing rights for a distance of twelve miles to seaward of that baseline; and

Be It Further Resolved, That upon such declaration, Canada be prepared to enforce such measures. (United States Consul, Vancouver, April 3, 1963.)

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FISHERIES PROBLEMS OF MARITIME PROVINCES DISCUSSED AT MEETING:

Fisheries problems affecting Canada's east coast were discussed in April this year at the Fifth Annual Meeting of the Federal-Provincial Atlantic Fisheries Committee. The Committee is made up of deputy ministers with responsibility for fisheries in the federal and the five Atlantic provincial governments. The meeting was opened by the Deputy Minister of Fisheries of Canada, as chairman.

At the April 25 session, the subjects covered included the programs of the Atlantic

Development Board, the Agricultural Rehabilitation and Development Act, and marine works in relation to fisheries. Later discussions dealt with the Atlantic program of the Fisheries Research Board of Canada; the program of the federal Department's Industrial Development Service; deep sea fleet development; vocational training; provincial programs; fishing gear and vessel technology; fisheries inspection; international regulations; the territorial waters question; fishing vessel subsidies; and the results of investigations made by the two special sections of the committee, one dealing with salmon and trout, the other with oysters.

Members of the committee present at the meeting or their representatives, in addition to the Deputy Minister of Fisheries, were the Deputy Minister of Fisheries of New Brunswick; the Deputy Minister of Trade and Industry of Nova Scotia; the Deputy Minister of Fisheries of Newfoundland; the Deputy Minister of Fisheries of Prince Edward Island; and a representative of the Assistant Deputy Minister (Fisheries), Department of Industry and Commerce of Quebec, Ont.

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APPROVAL OF JAPANESE HALIBUT FISHING IN EASTERN BERING SEA DELAYED:

It has been rumored that the Canadian Commissioners of the North Pacific Fisheries Commission would resign if Canada does not accept their recommendations that the Japanese be permitted to fish in the East Bering Sea. The Commissioners have withheld comment on the rumor, but one of the Commissioners is reported by the press to have stated "it will be a vote of nonconfidence in the Commission. We are mighty unhappy about the situation which has put us in a very embarrassing position. The Canadian Government must ratify the treaty soon, as it has only one year to go and the Japanese could give notice in June for negotiation of a new treaty. We of the Commission are concerned for the future preservation of fishing in the East Bering Sea for another 10 or 15 years. We don't want to have to negotiate another treaty."

These remarks were undoubtedly prompted by the statement made by the Canadian Prime Minister in an election campaign speech in Victoria, B. C., on March 25, 1963, that Canada was not rushing to sign the North Pacific Fisheries Agreement to allow Japanese fishermen to fish halibut in the East Bering Sea

Canada (Contd.):

and wants to make certain that Canada's fishermen are protected. (United States Consul, Vancouver, April 4, 1963.)

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PROCESSED SCALLOP PRODUCTS SUBJECT TO COMPULSORY GOVERNMENT INSPECTION:

The Department of Fisheries of Canada now requires compulsory inspection for processed scallop products. The regulations apply to frozen scallops as well as breaded cooked scallops. Fresh (iced) scallops have been subject to compulsory inspection since 1961.



Inspected frozen fish is labeled "Canada Inspected" and inspected fresh fish is labeled "Processed Under Government Supervision."

The scallop fishery of the Canadian Maritime Provinces has grown rapidly in recent years. In order to insure that only top quality scallops reach the consumer, the Department of Fisheries has established standards for freshness, processing facilities, and packaging. In 1960, the bulk of the scallop production was marketed in the fresh state, but since then there has been considerable development in the production of frozen and breaded cooked scallops.

The new regulations also establish the maximum amount of breading and batter that can be used on scallop meat. The proportion is similar to that which was established for fish sticks several years ago.

The standards for plants processing scallops are identical to those set for other fish-processing plants under Canadian Government Specifications Board requirements for certification. Scallops either in the fresh or frozen form which are of the highest quality--those which are graded No. 1--may be stamped

with the "Canada Inspected" designation. (Trade News, March 1963, Canadian Department of Fisheries.)

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IMPORTS OF OCTOPUS FOR HALIBUT BAIT INCREASE:

Almost a million pounds of frozen octopus from Japan and Korea were in Prince Rupert cold-storage houses early in March this year awaiting the beginning of the halibut season. For the 75 halibut fishing vessels out of this port, it is the most prized bait.

A total of 11,000 cartons of 50 pounds each of chopped up, frozen octopus were unloaded on March 2-3 from the Japanese freighter Yamakiku Maru.



These 50-pound cartons of frozen octopus are part of a 550,000-pound shipment unloaded in Prince Rupert early this month. The chopped-up frozen octopus is sold to fishermen for 32 to 34 cents per pound.

The season's needs of the Prince Rupert Fishermen's Cooperative, about 300,000 pounds, had already arrived by rail from Vancouver. It had been purchased in Korea. This represents a substantial increase from the 60,000 pounds imported by the Cooperative from Korea in 1962. Skinned before freezing, the Korean product has the advantage of saving time and labor at this end.

Purchasing of octopus from Japan, which has a big home consumption, began about four years ago. With the arrival of the load on the Yamakiku Maru, the amount of frozen octopus in Prince Rupert reached a record level of one million pounds.

Canada (Contd.):

Use of octopus as bait has grown to proportions unthought of by early-day commercial fishermen. The local fishing fleet has recognized its value for years, however, and baited their hooks with the leathery flesh whenever it was obtainable. When the Orient opened up as a source of supply, the local industry was one of the first to buy from there.

Tough, and thus capable of hanging on longer and better, octopus is generally preferred now to traditional baits, such as herring, grey cod, or salmon.

A big halibut fishing vessel such as the Northern Dawn will take 8,000 pounds of octopus on a trip calculated to yield, if fishing is good, about 125,000 pounds of halibut. Most fishermen do not use only the octopus as a lure. They will intersperse it with herring or chunks of grey cod. It sells to the fisherman between 32 and 34 cents a pound, a price which fishermen regard as too high. Some say they think the price peak has been reached, and that prices will start getting lower.

The Far Eastern season for catching octopus extends from September to the end of March. One would be inclined to think that the Koreans and Japanese dive for these tentacled creatures of the deep, but this is not so. Octopus have a way of eluding divers. So the standard method is by set gear. As soon as one hook snags an octopus, others come to see what has happened and get caught themselves, according to the production manager of the cooperative who visited Korea in 1962 to purchase frozen octopus for bait. (Western Fisheries, March 1963.)

* * * * *

LOBSTER OPEN SEASON POSTPONED IN TWO AREAS DUE TO ICE FLOES:

Severe ice conditions in parts of the Gulf of St. Lawrence, Northumberland Strait, and the Strait of Canso caused the postponement of the opening of lobster fishing seasons in two areas.

The Canadian Fisheries Minister on April 26, announced that as a result of representations for the postponement of the opening seasons in Lobster Districts 7B and 7A, the Department of Fisheries on April 25 conducted an aerial survey, which indicated that ice conditions were extremely bad and would re-

main so for some time. For that reason, the Minister decided to postpone the opening date in District 7B, which includes the waters off Restigouche and Gloucester Counties and part of Northumberland County, New Brunswick, and the outer coast of Prince Edward Island, until May 7. He also decided to postpone the opening date in District 7A, which is the eastern part of Canso Strait, until May 10. Additional time was to be added to the latter end of the seasons in both districts.

As an experiment, fishermen in both districts were allowed to set traps in both areas 2 hours earlier than usual--at 8:00 a.m. on the day before the opening date. By the experiment, traps could be legally set in Lobster District 7B at 8:00 a.m. on May 6 and in District 7A at 8:00 a.m. on May 9.

The Department of Fisheries continued checking ice conditions until the opening dates. (Department of Fisheries, Ottawa, Canada.)

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WEST COAST HERRING LANDINGS SET NEW RECORD FOR 1962/63 SEASON:

The Canadian west coast 1962/63 herring season ended March 10, 1963, with landings totaling a record 265,647 tons. This amount exceeds the previous record of 253,000 tons landed in the 1955/56 season.

Production of fish meal amounted to 48,015 tons, about 9,000 tons more than in the 1961/62 season. Oil production was 4.8 million gallons, or about 100,000 gallons above the previous season. The 1962/63 season was curtailed by an 8-week vessel tie-up in October-November, the period when oil production is highest.



Fishing was good in all areas of the British Columbia coast, although bad weather at times cut the production to almost nothing. The Central area of District 2 was the top producer, with landings of 62,626 tons which is a record for that area, and 23,000 tons more than last season's landings. The lower east coast--where quotas were extended on two occasions--produced 55,665 tons. The northern area, where fishing in Freeman Pass had been good for two years, was third in production with 42,792 tons.

Canada (Contd.):

Queen Charlotte Islands produced 19,856 tons, the best landings since 1959.

Fishing on the British Columbia west coast was also good, although landings were considerably less than in 1959 and 1960. Production of 49,304 tons was almost identical with last season. Middle east coast British Columbia landings were 24,707 tons, higher than average, and landings of 10,697 tons in the upper east coast were about average.

Only 786 tons of herring were frozen for bait, much less than average. Record shipments of octopus from Japan and Korea into Prince Rupert this past winter have cut down the market for herring bait in the halibut fishery. (Western Fisheries, March 1963.)

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PRODUCTION, UTILIZATION, AND FOREIGN TRADE IN MARINE OILS, 1962:

The worldwide decline in the price of fish oils has strongly affected Canadian utilization and foreign trade in marine oils. Canada's production of marine oils declined only slightly in 1962 and fish oil production may be maintained at about the same level in 1963 if fish meal prices continue at a profitable level.

Table 1 - Canada's Production of Marine Oils, 1960-1962 and 1956-1960 Average

	1/1962	2/1961	2/1960	5-Year Avg. 2/1956-60
	..... (1,000 Pounds)			
Atlantic				
Production:				
Cod oil . . .	3/	3/	7,725.0	7,393.2
Other . . .	3/	3/	4,493.4	5,752.6
Total . .	10,628.6	10,649.6	12,218.4	13,145.8
British Columbia				
Production:				
Herring oil .	41,029.9	42,862.8	15,985.4	29,551.0
Total . .	51,658.5	53,512.4	28,203.8	42,696.8

1/Preliminary.

2/Revised.

3/Not available.

Note: Production data converted to pounds using the factor 9,307 pounds equal 1 Imperial gallon.

The quantity of marine oils used in Canadian margarine and shortening continued to increase in 1962. The decided switch in Canada from vegetable oils to marine oils for margarine production began in the middle of 1961 when the price of fish oils began to decline.

Table 2 - Canada's Use of Marine-Animal Oils in Margarine and Shortening Production, 1960-1962 and 1956-1960 Average^{1/}

Item	2/1962	3/1961	3/1960	5-Year Avg. 3/1956-1960
	..... (Million Pounds)			
Margarine:				
Production . .	187.0	184.0	166.6	144.0
Marine Oils:				
Quantity used in margarine	48.3	31.6	12.4	15.8
Percentage of tot. oils used	32.2	21.3	9.1	13.5
Shortening:				
Production . .	181.6	167.4	164.5	161.4
Marine Oils:				
Quantity used in shortening	21.6	16.9	7.5	15.5
Percentage of tot. oils used	11.9	10.1	4.6	9.6

1/Refined oil basis.

2/Preliminary.

3/Revised.

Table 3 - Canada's Exports of Marine Oils, 1960-1962

Commodity and Country of Destination	1962	1961	1960
	..... (1,000 Pounds)		
Cod-Liver Oil:			
United Kingdom	1,288	1,338	1,543
United States	4,900	5,883	6,829
Other countries	-	3	-
Total	6,188	7,224	8,372
Herring Oil:			
United Kingdom	-	515	21,760
United States	88	444	60
Other countries	-	-	1,208
Total	88	959	23,028
Whale Oil:			
United States	-	129	64
United Kingdom	593	-	-
El Salvador	661	-	-
Other countries	5	-	-
Total	1,259	129	64
Other Fish and Marine Animal Oils:			
United States	126	519	225
Other countries	54	17	1
Total	180	536	226
Total Exports	7,715	8,848	31,690

Table 4 - Canada's Imports of Marine Oils, 1960-1961 and January-October 1961-1962

Commodity and Country of Origin	January-October		Year	
	1962	1961	1961	1960
	..... (1,000 Pounds)			
Cod-Liver Oil:				
United Kingdom . . .	402	630	917	1,353
Norway	23	32	48	122
United States	22	12	12	-
Other countries . . .	61	-	5	-
Total	508	674	982	1,475
Whale and Sperm Oil:				
United Kingdom . . .	104	291	350	298
United States	510	505	693	264
Norway	89	73	96	67
Total	703	869	1,139	629
Other Fish and Marine-Animal Oils:				
United States	8,749	17,703	17,732	10,198
Iceland	15,223	4,100	12,711	-
Bahama Islands . . .	-	948	948	-
Other countries . . .	161	100	102	79
Total	24,133	22,851	31,493	10,277
Total Imports	25,344	24,394	33,614	12,381

Canada (Contd.):

Total exports of marine oils in 1962 were 12.8 percent below the depressed levels of 1961. The decline would have been even greater except for a modest recovery in whale oil exports in 1962. Canada became a net importer of marine oils in 1961 when foreign markets for herring oil were lost. Canadian marine oil imports during the first 10 months of 1962 were 3.9 percent greater than in the same period of the previous year. During January-October 1962, Iceland replaced the United States as Canada's leading supplier of marine oils. (U. S. Embassy, Ottawa, April 18, 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 80.

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FRESH-WATER FISH USED IN MAKING FISHERY PRODUCTS SPECIALTIES:

In the past, whitefish and pike usually appeared in Canadian markets as either whole or dressed fish, or as fish fillets. Now those species are being offered to Canadian consumers in the form of fishfurters, fish loaves, and fish croquettes. All are marketed in the frozen form.



The fishfurters, as their name indicates, are fish sausages. Although they resemble frankfurters in size and shape, they are not smoked. Their flavor is delicate and distinctive from that of meat sausages.

Somewhat similar in idea, but different in flavor, is a rounded fish loaf shaped like a small bologna roll. It can be sliced and served hot or cold.

Perhaps the most unique of the new products is fish croquettes. Oblong in shape and deep brown in color, the croquettes are eye-appealing. Inside they are firm, smooth, and white. As they have been cooked in vegetable oil, those whose diets restrict animal fats can enjoy them.

The plant in which the fishfurters and croquettes are processed operates under Canadian Government supervision and products from the plant may show the maple leaf insignia of the Canadian Department of Fisheries. (Trade News, March 1963, Canadian Department of Fisheries.)



Ceylon

IMPORT LICENSES FOR FISHERY PRODUCTS REQUIRED:

The Ceylonese Controller of Imports and Exports, in a Notice issued on April 18, 1963, announced that an individual license would be required to import fish products and preparations from any source into Ceylon.

According to a newspaper report, the Ceylonese Cooperative Wholesale Establishment has been unable to dispose of a large stock of canned fish. It is expected that the special import license system will be lifted as soon as those stocks are sold. (United States Embassy, Colombo, April 25, 1963.)



Chile

FISHERIES POTENTIAL STUDIED BY NORWEGIAN MISSION:

A semiofficial Mission consisting of 13 Norwegian businessmen spent two weeks during March 1963 in Chile to study investment opportunities offered by Chile's marine resources. Of primary interest to the group is the production of fish meal and fish oil, frozen fish fillets, and fishing equipment. The Mission traveled first to the south to investigate, in particular, processing of the excellent fish believed to exist in commercial quantity out of Puerto Montt. Later the group went north to visit the Arica-Iquique area.

A new fish-meal plant has been established at Pisagua by Norwegian interests. Its present monthly production is 2,000 tons of fish meal. The plant was designed to permit expansion of its capacity to 60,000 tons per year. Exports are shipped directly from Pisagua. (United States Embassy, Santiago, March 18, 1963.)

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Chile (Contd.):

FISHERIES TRENDS, APRIL 1963:

The interest of both the Chilean Government and private capital appears to be shifting to processing of fish for human consumption (frozen, canned, salted, and smoked). A wholesale terminal is to be established within the year to facilitate the marketing of fresh fish and fish products brought to Santiago. The possibility of shipping fish fillets by refrigerated cars from Puerto Montt is under study. Distant small fishing villages are being encouraged to increase the output of smoked fish as the national demand exceeds the present supply.

A Chilean periodical reports that most, if not all, sites in Iquique have been taken, primarily by the fish-meal industry. Several of the established companies, however, are investigating the feasibility of adding facilities to process tuna and bonita in lieu of further expansion of the fish-meal plants. This relative new interest in the processing of tuna is likely to influence Chile's position with respect to the proposed yellowfin tuna conservation program.

A South African firm with investments in the Chilean fish-meal industry plans to invest an additional US\$280,000 in its Iquique fishing and fish-meal operations.

A jointly owned Japanese and United States firm's application to the Chilean Foreign Investment Committee to invest \$225,000 to produce fishing nets, floats, and other fishing gear in Iquique has been approved.



Typical Chilean fishermen fishing for tuna.

The Chilean Government has not yet given its approval to the proposed investment guaranty agreement under which the United States Government could insure U. S. investments

against political risks or war damage. (United States Embassy, Santiago, April 22, 1963.)

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FISH MEAL AND OIL INDUSTRY TRENDS, 1962:

Fish-meal production in Chile during 1962 amounted to 91,588 metric tons, up 57.2 percent from the production of 58,252 tons in 1961. Chilean exports of fish meal in 1962 were 75.6 percent greater than in the previous year. In 1962, the Netherlands was the leading buyer of Chilean fish meal, followed by the United States, Belgium, and West Germany.

Table 1 - Chilean Exports of Fish Meal by
Country of Destination, 1961-1962

Commodity and Country of Destination	1962	1961
.. (Metric Tons) ..		
Anchovy Meal:		
Brazil	-	184
Belgium	600	900
France	800	600
Germany	1,600	100
Netherlands	2,200	1,700
United Kingdom	200	-
United States	1,500	2,644
Venezuela	-	220
Total	6,900	6,348
Unclassified Fish Meal:		
Belgium	9,878	1,000
Cuba	500	-
Finland	150	-
France	3,225	1,588
Germany	8,591	3,204
Italy	600	-
Netherlands	13,169	13,920
Norway	-	250
Panama	500	-
Poland	2,500	-
Spain	4,000	-
Sweden	150	200
United Kingdom	5,774	532
United States	10,271	9,849
Venezuela	5,962	4,128
Other countries	-	73
Total	65,270	34,744
Grand Total	72,170	41,092

Chilean exports of fish oil in 1962 were up 137.3 percent from those in the previous year. The Netherlands took 73.7 percent of Chile's 1962 fish oil exports.

Table 2 - Chilean Exports of Fish Oil by Country
of Destination, 1961-1962

Country of Destination	1962	1961
.. (Metric Tons) ..		
Belgium	250	-
Denmark	-	56
Germany	2,256	3,946
Netherlands	8,035	168
Norway	368	428
Total	10,909	4,598

The growth of the fish-meal and fish-oil industry in Chile is reflected in that country's

Chile (Contd.):

Table 3 - Chilean Fishery Landings, 1960-1963

Year	Fish	Shellfish (Metric Tons)	Total
1962	577,373	52,583	629,959
1961	388,819	40,932	429,751
1960	304,667	35,038	339,705

fishery landings which in 1962 showed an increase of 85.4 percent over landings in 1960. Continued expansion of the Chilean fish meal industry is expected in the next few years. The Government of Chile is implementing its fisheries development policy with loans, credits, and other types of aid. (United States Embassy, Santiago, April 15, 1963.)

* * * * *

WHALING INDUSTRY TRENDS, 1962:

Chilean whalers took 2,340 whales in 1962, or very close to the 2,334 caught in the preceding year. Sperm whales constituted about 97.5 percent of the total 1962 catch.

The 1962 catch yielded 6,435 metric tons of sperm oil, 271 tons of whale oil, and 2,250 tons of whale meal. Production in the previous year amounted to 6,195 tons of sperm oil, 1,485 tons of whale oil, and 1,498 tons of whale meal.

Table 1 - Chilean Exports of Sperm and Whale Oil by Country of Destination, 1961-1962

Country of Destination	1962 (Metric Tons)	1961
United States	-	1,310
Argentina	226	17
Germany	2,998	200
Netherlands	1,588	1,122
Norway	640	-
Total	5,452	2,649

Total exports of whale and sperm oil in 1962 were more than double the amount shipped out in the previous year. But shipments of whale meal showed a small decline in 1962.

Table 2 - Chilean Exports of Whale Meal by Country of Destination, 1961-1962

Country of Destination	1962 (Metric Tons)	1961
United States	781	912
Germany	50	-
Netherlands	100	-
United Kingdom	-	200
Sweden	10	-
Switzerland	50	-
Total	991	1,112

Chilean imports of whale meal and oil are negligible. (United States Embassy, Santiago, April 15, 1963.)



Cuba

FISHERY TRAINEES SENT TO SOVIET UNION:

The Fishery Department of Cuba's Instituto Nacional Reforma Agraria has sent 185 fishery and naval trainees to the Soviet Union. They left Havana on February 13, 1963, aboard the Soviet liner Baltika for Kaliningrad where they will be trained mainly in the management of ports as ship dispatchers, shipyard workers, electricians, crane operators, etc. Some of the trainees will specialize in fishery subjects, mainly fish processing. (Unpublished sources.)



Ecuador

PERMIT GRANTED TO FOREIGN FREEZERSHIP TO PURCHASE FISH:

In an Executive Decree dated January 30, 1963, the Ecuadoran Government granted a permit to a foreign-owned freezership, the Arctic Maid, to purchase fish in Ecuadoran waters for one year. The decree provides that the owners of the Arctic Maid will grant credits up to US\$32,000 to fishing cooperatives and other organizations. In addition, the freezership is prohibited from purchasing fish from fishermen who already have contracts to sell their fish to other purchasers. The Decree also provides that the owners of the Arctic Maid shall submit a plan for the establishment of a land-based freezing plant and a five-year operating plan. (United States Embassy, Quito, April 1, 1963.)



Faroe Islands

FISHERIES TRENDS, APRIL 1963:

The decision by Denmark to extend the fisheries limits around the Faroe Islands from 6 to 12 miles effective from March 12, 1964, satisfies neither the Faroese nor the British. The Faroese wanted the new limits to become effective April 28, 1963, and the British desired no change. In the intervening period it is expected that the Faroese will attempt to meet the threatened blockade of their landings of fresh fish in British ports by shifting to processing and freezing their catches so they may be marketed as frozen fillets or blocks in Europe or in the United States. A cold-storage plant with a frozen-fish capacity of 6.6 million pounds is planned for construction in Klaksvig, Faroe Islands.

In early April 1963, Faroese fishermen and vessel owners avoided a tie-up by renewing their annual agreement after the Government guaranteed the fishermen a minimum wage of 1,000 kroner (US\$145) monthly while employed on fishing vessels, and promised to remove the export tax on dried and salted fish and salted herring, as requested by the vessel owners.

Faroe Islands (Contd.):

In April 1963, the first keels were laid for the construction of five long-line vessels in East Germany for delivery to the Faroe Islands in February and March 1964. The contract was entered into several years ago by the Faroese herring sales organization (Føroya Sildasøla), when East Germany stipulated that at least 5 Faroese fishing vessels must be built in East Germany in return for its purchases of Faroese salted herring. A new Faroese company has taken over the contract, which amounts to 6 to 7 million kroner (US\$870,000-1,015,000), and will offer the vessels to interested Faroese vessel operators. If there is not sufficient demand, the vessels will be offered for sale to other countries. The cutters are to be 118 feet long and are designed for distant water fisheries. The vessels powered by Diesel engines, will carry a crew of 25 and have a capacity of 160 tons of salt fish. The vessels are being constructed by the Government-operated shipyard in Beussenburg in North Germany, a few miles from the West German border. Faroese fishermen are anxious to see how the first East German built long-line cutters will perform, although it is reported that Soviet fishermen have had good experiences with them in the North Atlantic fisheries.

Following their usual practices, about 14 West German trawlers (including some of the newest 1,000-ton stern trawlers) planned to stop in Thorshavn, Faroe Islands, in April and May this year to take on board about 100 Faroese fishermen to augment their crews for the Greenland fishery. In prior years, the Faroese have been paid a fixed daily wage, but this season at least one of the trawlers is offering only the same share arrangements as the German fishermen receive.

Faroese fishermen have asked the Government to curtail the seal population around the islands which has grown to an estimated 30,000 since hunting ceased. They believe the seals consume 162,000 metric tons of fish annually and could be hunted profitably for their skins and blubber which, salted in barrels, are reported to bring good prices in export markets.



Plans are reported under way to utilize an old whaling station at Strømø in the Faroe Islands during the summer of 1963 to produce herring meal and oil which will provide additional employment and develop new export possibilities. Despite a poor whaling season in 1962, earlier efforts were directed toward whaling again in 1963, especially to produce whale meat for food for the local population. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, April 24, 1963.)



France

IMPORT LICENSES MAY NOT BE ISSUED FOR FROZEN TUNA IN 1963:

The French Government is not expected to issue import licenses for frozen tuna in 1963, according to Japanese trade circles. In 1962, France had issued import licenses for 3,500 metric tons of frozen tuna and it was hoped that she would, in 1963, import between 4,000 to 6,000 tons of tuna. Reportedly, French tuna fishing vessels are making excellent catches this year and the French Government has decided not to allow tuna im-

ports in 1963 so as to maintain domestic tuna prices. (Suisan Tsushin, March 30, 1963.)



French Guiana

TWO UNITED STATES FIRMS EXPAND SHRIMP OPERATIONS:

The fleet of 33 shrimp trawlers which will be fishing for the 2 United States firms with processing facilities in French Guiana should produce an annual catch with a value of at least US\$3.3 million. A shrimp vessel can catch substantially more off French Guiana than in the heavily fished waters along the Gulf Coast of the United States, according to representatives of both companies.

The operation was pioneered by a fishery firm of Tampa, Fla., which established a shrimp-packing plant at St. Laurent, French Guiana, in the latter part of 1962. Blast-freezing and cold-storage facilities at the base are now being expanded. In late March 1963, a fleet of 9 vessels was serving the St. Laurent plant, and an additional 9 shrimp vessels were enroute from the United States to St. Laurent.

The second shrimp-fishing operation in French Guiana, which is based at Cayenne, represents a joint venture by a fishery firm of Miami, Fla., and local businessmen in French Guiana. The Miami firm owns the 15 shrimp trawlers operating out of Cayenne and has a majority interest in the shore facilities. The shore plant includes a blast-freezer with a capacity of 30,000 pounds and a cold-storage warehouse with a capacity of 800,000 pounds. The facilities could service a larger fishing fleet and the management expects to add more vessels in the coming months.

The shore installations and fishing fleets of the shrimp bases at St. Laurent and Cayenne represent a combined investment of about \$2 million. (United States Consulate, Martinique, March 26, 1963.)



German Federal Republic

FISH MEAL AND MARINE OIL INDUSTRY TRENDS, 1962:

Fish Meal: Consumption of fish meal in West Germany reached a new high in 1962.

Germany Federal Republic (Contd.):

Table 1 - West German Supply and Distribution of Fish Meal^{1/}, 1961-1963

Item	2/1963	1962	1961
. . . . (1,000 Metric Tons)			
Supply:			
Opening stocks, January 1	8.0	11.0	2.0
Production	90.0	86.5	74.6
Imports	365.0	338.5	273.6
Total supply	463.0	436.0	350.2
Disposition:			
Exports	5.0	3.7	5.0
Domestic consumption:			
Animal feed	450.0	424.3	334.2
Stocks on hand Dec. 31	8.0	3/8.0	11.0

1/Includes small amounts of meat meal.

2/Forecast.

3/Estimated.

The increase was due mainly to a 7-percent gain in pork production, a 6-percent increase in egg production, and improved feeding practices. Imports of fish meal were at a record level in 1962 and accounted for 78 percent of West Germany's fish meal supply. Peru was West Germany's leading supplier of fish meal.

Table 2 - West German Foreign Trade in Fish Meal^{1/}, 1961-1962

Countries of Origin or Destination	1962	1961	Change from 1962
	(Metric Tons)		Percent
Imports:			
Peru	255,223	190,524	+ 34
Iceland	16,346	16,459	- 1
South Africa Republic . . .	18,518	6,453	+187
European Economic Community (EEC) Countries . .	6,865	2/	-
United States	1,062	293	+262
Other countries	40,503	59,941	-
Total imports	338,517	273,670	+ 24
Exports:			
EEC Countries	1,303	2/	-
Other Countries	2,405	3,383	-
Total exports	3,708	3,383	+ 10

1/Includes small amounts of meat meal.

2/Included in total for "other countries."

Edible Marine Oils: Domestic consumption of edible marine oils in West Germany during 1962 was 7 percent below that in the previous year. Actually the total consumption of all types of edible oils (vegetable and animal) increased 2.7 percent in West Germany in 1962. But marine oils suffered due to a decline in margarine consumption. The West German supply of edible marine oils in 1962 amounted to 129,100 metric tons (table 3).

Inedible Marine Oils: From domestic materials, West German plants produced 9,200 tons of inedible marine fats and oils in 1962 as compared with 8,400 tons in the previous year. In addition, imports of in-

Table 3 - West Germany Supply and Distribution of Edible Marine Oils^{1/}, 1961-1962

Item	2/1962	3/1961
(1,000 Metric Tons)		
Supply:		
Stocks on hand, January 1 ^{4/}	8.0	5.0
Production	14.8	13.6
Imports:		
Whale oil	49.9	66.6
Fish oil	56.4	55.8
Total imports	106.3	122.4
Total supply	129.1	141.0
Disposition:		
Exports:		
Whale oil	2.2	-
Fish oil	17.8	20.5
Total exports	20.0	20.5
Domestic consumption	104.1	112.5
Stocks on hand, December 31 ^{4/} . .	5.0	8.0

1/Includes crude and refined oils.

2/Preliminary.

3/Revised.

4/Estimated.

edible marine oils into the country in 1962 totaled 17,600 tons and consisted of 9,200 tons of whale oil and 8,400 tons of fish body oils. In the previous year, inedible marine oil imports consisted of 8,800 tons of whale oil and 7,600 tons of fish body oil. (United States Embassy, Bonn, April 10, 1963.)

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ORDERS FOR NEW VESSELS BY SOVIETS UNCERTAIN:

Negotiations on ship orders held during the last part of January 1963 in Moscow between a team of directors of the West German Government-owned shipyard at Kiel, and a Soviet Foreign Trade Agency have been postponed for an indefinite period of time. The team, headed by the shipyard's Director General, returned to Kiel on January 30 not only without a contract but also "without a tangible result," according to the Director General. The shipyard declined any information on the reason for the postponement and on the size of the ship orders involved. The local press on February 2, however, cited well-informed circles as having mentioned an order for 3 or 4 fish factoryships.

In the postwar period the Soviet Union has placed ship orders with the shipyard at Kiel totaling about DM 500 million (US\$125 million). The orders included fish factoryships and whaling motherships. In mid-December 1962, the whaling mothership Vladivostok constructed by the Kiel firm was delivered to the Soviets. On that occasion, the Deputy Chief of Mission of the Soviet Embassy, expressed hope for agreement on future shipbuilding contracts

German Federal Republic (Contd.):

provided the shipyard offered acceptable terms. (United States Embassy, Bonn, February 5, 1963.)



Ghana

TERRITORIAL WATERS EXTENSION DEBATED:

The Government of Ghana on March 22, 1963, published a bill entitled "Territorial Waters and Continental Shelf Bill." The bill, which was scheduled for debate March 28, contained the following main provisions:

- (1) Territorial waters of Ghana to extend 12 nautical miles from the low-water mark.
- (2) By legislative instrument the President may declare any part of the sea touching or adjoining the coast and seaward of the outer limits of the territorial waters to be the area over which the Government shall exercise any right of protection.
- (3) By legislative instrument the President may declare any area of the sea touching or adjoining the coast and within distance of one hundred nautical miles from the outer limits of the territorial waters to be a fishing conservation zone and may specify measures for conservation of the resources of such area.
- (4) The bill also gives Ghana the right to minerals and other inorganic as well as organic matter covered by territorial waters and of the continental shelf. The latter is defined as including the sea bed and subsoil of marine areas to a depth of one hundred fathoms contiguous to the coast and seaward of the area of land beneath the territorial waters of the Republic. (United States Embassy, Accra, March 22, 1963.)



Greece

ACTIVE SPONGE FISHERY EXPECTED IN 1963:

Fifteen Greek sponge fishing vessels will be licensed by the Libyan Government to operate in Cyrenaican waters during the sum-

mer of 1963. In addition, four Greek sponge vessels may work in Egyptian waters this summer.

At least 60 Greek vessels are expected to participate in the 1963/1964 sponge fishing season in their home waters. (Alieia, March 1963.)

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NUMBER OF FISHERMEN INCREASES:

At the end of 1961, there were 52,000 active fishermen in Greece, whereas in 1955 there were only 30,000, according to the Greek National Statistical Service. (Alieia, March 1963.)



Guinea

JOINT FISHING VENTURE WITH JAPANESE PROPOSED:

The Government of Guinea, West Africa, is reported to be seeking Japanese participation in a joint fishing venture in Guinea. The offer for joint operation was recently presented to the Japanese Overseas Fisheries Cooperative Association, a Government-sponsored organization, following the preliminary inquiry made by the Guinean Minister of Commerce during a visit to Japan. Guinea is primarily interested in Japanese investments in the form of fishing vessels, fish-meal plant, and other base facilities. Guinea is to invest 51 percent and Japan 49 percent in this joint venture, and remittance of profits to Japan will be permitted in accordance with the domestic law of Guinea. The Overseas Fisheries Cooperative Association planned to sound out the views of Japanese fishing firms on the offer by the end of April 1963.

Fish production in Guinea, which is estimated at about 6,000 metric tons annually (4,000 tons by coastal fishermen and 2,000 tons by the joint Guinean-Polish trawling enterprise), is said to be inadequate to supply the domestic market. The Guinean Government therefore plans to raise the annual fish production to 12,000-18,000 tons, primarily by increasing tuna production from coastal waters. (Minato Shimibun, April 24, 1963.)



Iceland

CONTRACT SIGNED FOR SALE OF FROZEN FISH FILLETS TO THE SOVIET UNION:

The Icelandic Freezing Plants Corporation and the Fisheries Department of the Icelandic Federation of Cooperatives (Samband) signed a contract on April 2, 1963, with the Soviet Union for the sale in 1963 of 15,000 metric tons of frozen fish fillets, including cod, ocean perch, haddock, catfish, saithe (pollock) and ling. The contract was based on the 3-year bilateral trade protocol between Iceland and the U.S.S.R. which was negotiated in late 1962. (United States Embassy, Reykjavik, April 5, 1963.)

Note: See Commercial Fisheries Review, April 1963 p. 54.

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FISHERIES TRENDS, APRIL 1963:

Loans to Aid Fishing Industry: The Icelandic Development Loan Program for 1963 will benefit from a British loan of Kr. 240 million (US\$5,574,000) which was arranged in early 1963. Under the allocation plan for the British loan, Kr. 50 million (US\$1,161,000) will be made available to private borrowers in the fishing industry. Most of this will be used for the construction of herring meal and oil plants on the southwest coast, according to an official of the Icelandic State Herring Production Board. The new reduction plants would relieve the present shortage of processing facilities during the peak of the herring fishing season. Part of the fisheries loan funds may also be used to modernize existing herring canneries.

The Icelandic fishing industry may also benefit from the proposal to allocate Kr. 50 million (US\$1,161,000) of the British loan for harbor development in Iceland.

Trawlers Handicapped by Labor Shortage:

A number of trawlers were idled because adequate crews could not be found and some trawlers were operating with only 24 of their normal complement of 30 men.

The labor shortage for the fishing industry in general is aggravated by (1) increasing competition from other industries; (2) the expansion of Iceland's fishing fleet; (3) the longer fishing seasons and larger catch; and (4) the decreasing number of foreigners who are attracted to Iceland for the fishing season. The Faroese find increasing employment at home as their own fishing fleet grows and the Spaniards find it difficult to

learn Icelandic fishing methods partly because of the language barrier. The incentive offered to attract fishermen from other countries usually involves a travel allowance which makes such labor very expensive for a single season. (United States Embassy, Reykjavik, April 25, 1963.)

Note: Icelandic kronur 43.06 equals US\$1.00.



India

IMPORTS OF MARINE OILS, 1961-1962:

India's limited imports of marine oils consist mainly of medicinal oils. The United Kingdom was India's leading supplier of marine oils in 1961 and 1962.

India's Imports of Marine Oils, 1961-1962		
Commodity and Country of Origin	1962	1961
	.. (Metric Tons) ..	
<u>Cod Liver Oil:</u>		
United Kingdom	12.6	51.9
Norway	28.6	11.9
Other countries	-	1.2
Total cod-liver oil	41.2	65.0
<u>Shark Liver Oil:</u>		
Japan	-	5.4
<u>Sperm Oil:</u>		
United Kingdom	38.2	46.9
Norway	8.7	10.7
West Germany	0.5	-
Japan	-	10.0
Other countries	0.3	15.3
Total sperm oil	47.7	82.9
<u>Unclassified Marine Oils:</u>		
United Kingdom	28.9	66.5
Czechoslovakia	0.3	-
United States	50.6	0.4
Norway	5.0	27.7
Other countries	0.6	2.7
Total unclassified marine oils	85.4	97.3
Total marine oils	174.3	250.6

Source: Monthly Statistics of the Foreign Trade of India, Department of Commercial Intelligence and Statistics, Calcutta, India.

In India, the emphasis is on the production and use of vegetable oils. Animal and marine oils play an insignificant role because of the religious sentiments of the majority of the population. (Foreign Agricultural Service, United States Embassy, New Delhi, April 11, 1963.)

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U. S. FIRM TO SURVEY FISHERY RESOURCES FOR INVESTMENT OPPORTUNITY:

A study which may lead to the establishment of a new marine fisheries industry in India to be undertaken under an investment survey was announced on April 10, 1963, by the Agency for International Development (AID). The survey will be made by a tuna canning firm of Long Beach, Calif., which is considering the possibility of becoming as-

India (Contd.):

sociated in the project in cooperation with Indian investors.

AID will finance half the cost of the survey, or up to \$17,500, as part of a program to encourage the investment of private United States capital in business enterprises in countries receiving economic assistance from the United States.

The California firm is sending a 4-man team to India to make the survey, which will include a study of shrimp, tuna, sardine, and mackerel resources, the facilities required, and the financial outlay necessary.

Preliminary information suggests that 5 to 7 separate establishments may be desirable and that the initial capital requirement will be substantial. Fish meal and oil may be produced as well as other fishery products.

**Iran****FISHERIES DEVELOPMENT PROJECTS:**

A resolution calling for the creation of a Southern Fisheries Company was approved by the Government of Iran at a Cabinet meeting on March 31, 1963, according to the Iranian press. The purpose of the new company will be to supply Iran with fish and to aid the economic development of southern Iran. It will have a capital investment of 500 million rials (US\$6.6 million). Its stockholders will include the Iranian Ministry of Finance, the Southern Ports and Islands Development Aid Organization, the Agricultural Credit and Rural Development Bank, and the Armed Forces Cooperative Society. The Ministry of Finance may sell up to 3,750 of its shares to the public. Buyers will have to pay in 40 percent of the value of their shares which will be worth 20,000 rials (\$264) each.

Tehran newspapers announced in late March 1963 that an Iranian-Soviet agreement for the establishment of fish hatcheries in the Caspian Sea would be signed in the near future. The reports stated that two Soviet fish breeding experts had recently completed studies in Iran. (United States Embassy, Tehran, March 26 and April 9, 1963.)

Notes: (1) Iranian rials 75.75 equals US\$1.00.

(2) See Commercial Fisheries Review, September 1962 p. 80.

Ireland**DEVELOPMENT OF FISHING INDUSTRY PLANNED:**

An outline of Ireland's current thinking and plans for the development of the Irish sea fishing industry was given by the Parliamentary Secretary to the Minister for Lands (with special responsibility for fisheries) on March 31, 1963.

This program will be centered around the expansion of inshore fishing fleets owned by Irish fishermen, small companies, and cooperatives. The Sea Fisheries Board, under its first full time chairman, will withdraw from fishing operations on its own account and will concentrate on financing vessel construction, the development of advisory services, and the building up of an extensive marketing organization.

Development of deep-sea operations is not being stressed at the present time, in view of the relatively small size of the fishing vessels presently available, as well as the reluctance of the Irish fisherman to take long trips which would keep him away from base for considerable periods.

The Sea Fisheries Board, however, is interested in attracting North American fishing fleet operators interested in entering the European markets to utilize Irish facilities. This could be done on a basis either of direct sales to the Sea Fisheries Board at Irish ports or on a joint enterprise basis with the Board. (United States Embassy, Dublin, April 19, 1963.)

**Italy****FISHERY LANDINGS, JANUARY-SEPTEMBER, 1962:**

Italy's fishery landings for the first 9 months of 1962 totaled 149,203 metric tons--a drop of 10.5 percent from the same period in 1961.

It was reported that the Italian fishing industry is in a somewhat precarious position with one of the more serious difficulties being the exclusion from traditional fishing grounds off the Moroccan and Mauretanian coasts as a result of the extension of territorial waters to 12 miles. (The Fishing News, April 5, 1963.)



Japan

ATLANTIC OCEAN TRAWL FISHERY TRENDS, APRIL 1963:

The 2,524-ton Japanese stern trawler Unzen Maru was scheduled to depart for the fishing grounds off the South African coast in late April 1963. The trawler will operate out of Cape Town, South Africa Republic, for about one year.

A total of nearly 30 large Japanese trawlers are expected to fish in the Atlantic Ocean in Fiscal Year 1963 (April

metric ton in Japan. In March 1963, a 44-pound (net content) case of "monko ika" sold for 5,000 yen (US\$13.88), or about 32 U.S. cents a pound. Supply was reported to be very short and the price for that product was expected to exceed 38 cents a pound due to reports that the Japanese trawlers operating off West Africa were experiencing poor fishing.

At the height of the "monko ika" fishing season off West Africa in 1962, that species reportedly constituted from 60 to 90 percent of each haul. However, fishing in January-March of this year was reported to be very poor, with "monko ika" making up an average of only about 20 percent of the



Japanese factoryship Tenyo Maru.

3-March 1964). Forecasts are being made that their combined landings will exceed 100,000 metric tons, of which nearly 30,000 tons are expected to be exported.

The 3,500-ton tuna mothership Tenyo Maru is to be converted into a stern trawler at a cost of approximately 200 million yen (US\$556,000). The vessel, due home in April from the South Pacific tuna fishing grounds, is scheduled to leave early in July for the North Atlantic where she will fish mainly for cod. The Tenyo Maru is scheduled to be based at Hamburg, West Germany.

One of the large Japanese fishing companies plans to cease temporarily its trawling operations off the northwest coast of Australia. Of the three 500-ton trawlers engaged in that fishery, the firm plans to divert two of them (Taiyo Maru, Nos. 2 and 5) to the Atlantic Ocean and possibly be based at Lagos, Nigeria. The third trawler (Taiyo Maru) is being assigned to operate in the area southeast of the Aleutian Islands. This vessel departed for the fishing grounds from Shimonoseki, southern Japan, on April 14.

Another Japanese fishing company is reported to be planning on dispatching a pair of 99-ton two-boat trawlers, Kyoshin Maru, Nos. 20 and 21, to the Atlantic Ocean in June. The trawlers are expected to be based at Las Palmas, Canary Islands.

A third Japanese fish company's 1,500-ton stern trawler Daishin Maru, No. 10, was scheduled to return to Tokyo on April 21 from the Atlantic Ocean with 900 metric tons of frozen fishery products. The Daishin Maru, which spent 14 months at sea, will return to the Atlantic Ocean upon completing repairs.

According to Japanese press reports, the Japanese trawlers operating off the coast of West Africa, in addition to fishing for sea bream and octopus, reportedly devote a great deal of their effort in fishing for a species of squid described commercially as "monko ika," "Monko ika" (monko squid) is described as a large squid with very tender and delicious meat and is said to be utilized primarily by the sashimi (raw fish) trade in Japan, being especially popular during the summer season.

In the summer of 1962, West African "monko ika" reportedly sold for 270,000-300,000 yen (US\$750-833) per

total catch. (Japanese newspapers, March 23, April 8, 12, 1963.)

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EXPORTS OF TUNA CANNED IN OIL AND SPECIALTY PRODUCTS, FY 1962:

A total of 1,613,402 cases of Japanese canned tuna in oil was approved for export in FY 1962 (April 1962-March 1963), according to data compiled by the Japan Export Canned Tuna Packers Association. This sets a new

Table 1 - Exports of Japanese Canned Tuna in Oil, FY 1962 with Comparisons

Principal Countries of Destination	FY 1962	FY 1961
.. (Actual Cases) ..		
West Germany	673,945	660,025
Canada	203,049	206,535
Switzerland	130,666	87,581
Netherlands	94,306	122,670
Belgium	93,860	58,759
United Kingdom	93,571	54,662
Lebanon	60,784	45,493
Aden	38,727	44,914
Syria	38,083	48,240

Table 2 - Exports of Canned Tuna in Oil, FY 1962 by Species

Species	FY 1962
<u>Actual Cases</u>	
Skipjack	634,892
Big-eye	458,209
Albacore	333,547
Tuna flakes	154,322
Yellowfin	32,432
Total	1,613,402

Japan (Contd.):

high in exports of tuna in oil, representing an increase of about 100,000 cases over FY 1961 exports, which totaled 1,513,395 cases.

Exports of canned tuna specialty products (other than those packed in brine and oil) totaled 445,352 cases. The pack consisted of 328,140 cases of vegetable tuna; 95,598 cases of jelly tuna; 14,168 cases of tuna in tomato sauce; 3,918 cases of curry tuna; 1,203 cases of tuna spread; 1,170 cases of tuna in soy sauce; and 1,155 cases of other packs. (Minato Shimbun, April 25, 1963.)

EXPORTS OF CANNED TUNA IN OIL INCREASING:

Exports of canned tuna in oil from Japan, which are increasing yearly, are expected to exceed 1.5 million cases in FY 1963 (April 1, 1963-March 31, 1964) as compared with 1.2-1.3 million cases exported in years prior to FY 1962. For the 11-month period, April 1962-February 1963, a total of 1.43 million cases of canned tuna in oil was exported. At that rate, a minimum export of 100,000 cases in March 1963 would raise the total FY 1962 exports of tuna in oil to over 1.5 million cases. Reportedly, the increase in volume of sales has not brought about a corresponding increase in profits. (Minato Shimbun, April 7, 1963.)

EXPORTS OF TUNA CANNED IN BRINE TO THE UNITED STATES, BY REGIONAL DESTINATIONS, 1958-1962:

Japanese exports of canned tuna in brine to the United States during 1958-1962 were relatively stable, averaging slightly over 2 million cases a year. But the ratio of white meat to light meat tuna in the export pack showed considerable fluctuation.

The eastern area's share of total Japanese canned tuna exports to the United States ranged between 56 and 63 percent in the 1958-1962 five-year period. During that period, shipments to the southern area, although showing some fluctuation, accounted for about 16 percent of the total and shipments to the western area accounted for about 13 percent. There was a definite upward trend in shipments to the central area between 1958 and 1961, followed by a modest decline in 1962.

Shipments to the eastern area have been heavily weighted in favor of white meat tuna, and to a lesser extent, the same has been true of shipments to the central area. Light meat tuna has generally predominated in shipments to the southern and western areas.

Japanese Exports of Canned Tuna in Brine to the United States, by Regional Destination, 1958-1962				
Regional Destination in the United States	Year	White Meat	Light Meat	Total
..... (Actual Cases)				
Eastern area	1962	854,426	381,918	1,236,344
	1961	1,124,021	202,208	1,326,229
	1960	679,690	420,615	1,100,305
	1959	733,140	471,380	1,204,520
	1958	969,281	320,661	1,289,942
Central area	1962	136,493	104,383	240,876
	1961	247,909	57,609	305,518
	1960	128,390	116,302	244,692
	1959	71,456	81,341	152,797
	1958	94,885	73,972	168,857
Southern area	1962	117,362	224,028	341,390
	1961	172,481	113,959	286,440
	1960	89,730	237,131	326,861
	1959	107,780	235,257	343,037
	1958	121,838	172,932	294,770
Western area	1962	109,289	180,308	289,597
	1961	125,396	108,275	233,671
	1960	64,739	223,980	288,719
	1959	78,514	217,498	296,012
	1958	87,038	187,582	274,620
Other areas	1962	350	1,580	1,930
	1961	845	1,515	2,360
	1960	531	4,440	4,971
	1959	705	3,245	3,950
	1958	920	2,475	3,395
Total, all areas . . .	1962	1,217,920	892,217	2,110,137
	1961	1,670,652	483,566	2,154,218
	1960	963,080	1,002,468	1,965,548
	1959	991,595	1,008,721	2,000,316
	1958	1,273,962	757,622	2,031,584

TUNA PRICES IN EARLY APRIL 1963:

According to a Japanese fisheries periodical, the supply of albacore and yellowfin tuna in Japan was light and the domestic demand was strong during early April 1963. This resulted in a situation where very little tuna was being exported to the United States since the export price was lower than ex-vessel prices. According to the periodical, yellowfin was selling at an ex-vessel price of about 128 yen per kilogram (US\$323 per short ton) and albacore at 150-155 yen per kilogram (US\$378-391 per short ton), but the export price f.o.b. Japan for these two species was about \$30-40 less per ton.

The price for a small quantity of yellowfin contracted for shipment to the United States early in April was reported to be \$310 per short ton, f.o.b. Japan. Transshipments of Atlantic Ocean albacore to the United States were quoted at \$320 per short ton and yellow-

Japan (Contd.):

fin at \$280-290 per short ton, f.o.b. Africa. Those prices represent a drop of about \$40 per short ton from the highest prices paid in 1963. As a result, a substantial portion of the Japanese-caught tuna in the Atlantic Ocean is expected to be transshipped to Italy and Yugoslavia, where prices are reported to be firm. (Suisan Tsushin, April 13, 1963.)

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EXPORTS OF FROZEN TUNA TO THE UNITED STATES SLUGGISH IN LATE APRIL 1963:

Frozen tuna exports to the United States in late April 1963 continued to be sluggish, with major United States tuna canners still withholding purchase of Japanese-caught tuna. Only a small quantity of Atlantic-caught tuna has been sold recently to one United States West Coast packer, and small shipments contracted for direct delivery from Japan to packers located outside of California.

Prices paid for tuna contracted for shipment to the United States during April 1963 were reported to be \$335 per short ton for Atlantic Ocean albacore, \$315 per short ton for Atlantic-caught yellowfin (gilled & gutted), both prices f.o.b. Africa; and \$300-\$310 per short ton for yellowfin tuna shipped directly from Japan. (Suisan Tsushin, April 25, 1963.)

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TUNA EXPORT QUOTAS FOR OVERSEAS BASES, FISCAL YEARS 1963 AND 1964:

The Japanese Fisheries Agency announced on April 9, 1963, that effective Fiscal Year (FY) 1964 (April 1964-March 1965), it was granting new tuna export quotas totaling 25,500 short tons annually to the three Japanese overseas-based operations at New Caledonia (7,500 tons), Fiji Islands (9,000 tons), and American Samoa (9,000 tons). For FY 1963 (April 1963-March 1964) the American Samoa and Fiji-based Japanese enterprises would only be granted export quotas of 4,500 short tons each.

The annual export quota of 9,000 short tons allotted for the American Samoa-based operation is in addition to the existing quota of 18,000 tons already allotted for operations based on that island. The additional 9,000-ton quota is being granted to one of the large Japanese fishing companies and the Central

Tuna Export Quotas for Japanese Overseas-Based Tuna Operations, FY 1963 and 1964

Locality	Fiscal Years	
	1963	1964
	... (Short Tons) ...	
Tutuila, American Samoa	22,500	27,000
Levuka, Fiji Islands	4,500	9,000
Noumea, New Caledonia	7,500	7,500
Penang, Malaya	6,000	6,000
Espiritu Santo, New Hebrides . . .	6,000	6,000
Total	46,500	55,500

Tuna Cooperative (composed of vessel owners who were granted special 99-ton tuna-vessel licenses in late 1962 under the Government's plan to aid the depressed coastal fishery), which are expected to employ a total of about 30 fishing vessels. Their catches are to be delivered to the United States tuna-canning plant presently under construction on American Samoa (second of its kind), and which is expected to begin operations sometime after July 1963. (Suisan Keizai Shimbun & Suisan Tsushin, April 10, 1963.)

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TUNA FISHING BASE AT FIJI ISLANDS:

Plans for the joint Japanese-British tuna venture in Levuka, Fiji Islands, were developing steadily during April 1963. That base, which is to be managed by the South Pacific Ocean Fisheries Cooperative, was recently granted a tuna production quota of 4,500 short tons for FY 1963 (April 1963-March 1964), with the quota allocation to be doubled to 9,000 tons in FY 1964. The Cooperative plans to operate 30 tuna vessels (under 100 tons gross) from the Fijian base, of which 13 vessels will be newly built. The Cooperative has been authorized a loan of 108 million yen (US\$300,000) from the Japanese Government for the construction of 3 vessels, and has obtained an informal loan approval for the remaining 10 vessels.

Landings at the Fijian base are to be delivered to the jointly-established Pacific Fishing Company at Levuka, where they will be frozen for export to the United States. Construction of the cold-storage plant for this company is expected to start soon with completion scheduled for December 1963. The plant will have a daily freezing capacity of 50 tons, ice-making capacity of 30 tons, and a storage capacity of 2,000 tons (another Japanese newspaper reported 3,000 tons). Japanese investments in the Pacific Fishing Company total 270 million yen (US\$750,000)--contributed by three Japanese trading firms. (Nihon Keizai Shimbun, April 23; Hokkai Suisan, April 29, 1963.)

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Japan (Contd.):

**OPERATORS OF TUNA MOTHERSHIPS
WITH PORTABLE CATCHER
VESSELS FORM ASSOCIATION:**

Japanese firms, operating tuna motherships with portable catcher vessels, on March 28, 1963, formed an Association to be known as the "Portable Fishing-Vessel Type Tuna-Mothership Operators Association." The new Association is made up of 17 firms with 38 motherships. The new Association will become a member of the Japan Federation of Tuna Fisheries Operators Associations. (Japanese newspaper, March 29, 1963.)

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**TUNA MOTHERSHIP TO BE CONVERTED
FOR NORTH ATLANTIC TRAWLING:**

The tuna mothership Tenyo Maru No. 3 (3,500 gross tons), which operated in the South Pacific Ocean in the vicinity of the Fiji Islands, returned to Tokyo with 2,700 metric tons of frozen fish, consisting of 970 tons of albacore, 700 tons of yellowfin, 470 tons of spearfish, 300 tons of other tunalike fish, and 330 tons of other fish. After unloading, the Tenyo Maru proceeded to Shimonoseki in southern Japan, where the vessel was scheduled to be converted into a stern trawler for bottomfish operations in the northwestern Atlantic Ocean in July or August 1963. (Suisan Tsushin, April 23, 1963.)

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**TUNA MOTHERSHIP TO FISH
OFF MEXICAN COAST:**

A Japanese fishing company was reported to be planning on dispatching its tuna mothership Keiyo Maru (3,700 gross tons) to the eastern Pacific Ocean tuna-fishing grounds off the coast of Mexico in June 1963, on a 220- to 230-day trip. The catch target is 2,000 tons of fish. The actual fishing will be conducted by the eight 20-ton portable catcher vessels which the mothership will transport to the fishing grounds. This type of mothership operation, in which only the portable catchers are used in the fishing, increases mobility and is said to be more efficient than the regular tuna mothership operation. (Hokkai Suisan, April 22, 1963.)

Under Japanese tuna mothership regulations established in September 1962, portable-vessel-carrying tuna motherships over 2,000 gross tons are classified as Class II motherships. Vessels in this category are not per-

mitted to engage directly in fishing and must use portable catchers in the actual fishing.

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**SECOND TUNA SEINER EQUIPPED
WITH POWER BLOCK:**

A second Japanese tuna vessel, the Hayabusa Maru (180 gross tons), was undergoing conversion to have a power block installed for purse-seine fishing in April 1963. The Hayabusa Maru was scheduled to depart for the skipjack fishing grounds off the coast of northern Japan in late April together with three other purse seiners, including Kenyo Maru (238 gross tons) the first Japanese vessel equipped with a power block. (Suisan Keizai Shimbun, April 10, 1963.)

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**TUNA BEHAVIOR NEAR
OCEAN FLOTSAM STUDIED:**

A report titled "On the Drifting Substances as a Means of Foretelling Oceanographic and Fishing Conditions of Skipjack and Tuna in the the Adjacent Waters of Japan," was made in April this year by a team of the Tokai University Fisheries Research Laboratory. The report (No. 1 of the research in environments affecting induction of skipjack and tuna) was presented at an annual meeting of the Society of Scientific Fisheries of Japan held at Tokyo University.

According to the report, flotsams are found mainly along the flow-path of the Kuroshio Current presumably coming from the South Sea islands or the southeastern outskirts of Japan. The appearance, distribution and movement of the flotsam varies a great deal each year due to variations in the way the Kuroshio Current runs. Most of the flotsam consists of drifting wood but generally is so varied as to include airplane fuel tanks, tires, and other objects. The investigation revealed that skipjack, yellowfin, big-eyed, and longfin tuna remained close to the flotsam and it was found that the tuna followed the flotsam regardless of any change in the sea area concerned. It was reported that the Tokai University Laboratory is to conduct an investigation during 1963, on the distribution and migration of a type of shearwater, a migratory bird which appeared regularly and in great numbers at the summer albacore fishing grounds, but whose appearance has decreased greatly in recent years. Bird-bindings are to be introduced from the United States for use in tagging and releasing the birds with cooperation of fishermen.

Japan (Contd.):

Editor's Note: Similar studies on tuna behavior near floating objects were conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Note: See Commercial Fisheries Review, November 1962 p. 22; December 1962 p. 31.

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EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-OCTOBER 1962:

Total Japanese exports of canned fishery products in January-October 1962 were about 7.4 percent higher than in the similar period of 1961. The increase was due primarily to a 70.0 percent increase in the exports of salmon trout.

Table 1 - Japanese Frozen Fishery Products Export Target for Fiscal Year 1963

Product	FY 1963		FY 1962 ^{1/}	
	Export Qty.	Target Value ^{2/}	Actual Qty.	Export Value ^{2/}
	Metric Tons	US\$	Metric Tons	US\$
Tuna	174,400	57,184	144,129	48,449
Swordfish	7,700	5,700	7,315	5,538
Salmon	2,000	2,000	1,523	1,628
Trout	1,200	1,080	1,062	972
Shrimp	2,000	3,200	1,729	2,726
Other	45,000	11,250	42,886	10,706
Total	232,300	80,414	198,644	70,019

^{1/}Figures for FY 1962 are estimates.

^{2/}Based on f.o.b. prices in Japan.

(1) Seek to have the United States lower her import duty on canned tuna in oil from the 35 percent (ad valorem) rate to the lower rate of 12.5 percent presently imposed on canned tuna in brine, and on canned crab from 22.5 percent (ad valorem) to 10 percent.

Japanese Canned Fishery Products Exports, January-October 1962					
Product	January-October 1962				January-October 1961
	United States	Canada	Other Countries	Total	Total
Crab meat	136,211	6,281	198,385	340,877	423,606
Tuna:					
In oil	-	183,756	929,108	1,112,864	1,359,197
In brine	2,023,407	-	-	2,023,407	2,127,426
Other types	1,646	8,835	321,057	331,538	203,144
Total tuna	2,025,053	192,591	1,250,165	3,467,809	3,689,767
Mackerel-pike	37,794	785	767,726	806,305	249,678
Sardine	20,978	13	91,791	112,782	270,961
Horse-mackerel	48	-	350,576	350,624	641,594
Salmon trout	103,994	182	1,643,858	1,748,034	1,030,331
Other fish	60,353	31,283	502,302	593,938	541,126
Shellfish	271,348	106,454	55,982	433,784	475,429
Other aquatic products	9,350	160	12,698	22,208	11,318
Grand total	2,665,129	237,749	4,973,483	7,876,361	7,333,810

^{1/}Tuna in oil and in brine cans in standard cases (48 7-oz. cans) and salmon trout in standard cases of (96 7-oz. cans); other products in actual cases.

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EXPORT TARGETS FOR FROZEN AND CANNED FISHERY PRODUCTS, FY 1963:

The Japanese Ministry of International Trade and Industry (MITI), after meeting with the Agricultural and Fisheries Products Export Committee (composed of Government and industry members) on March 19, 1963, set the frozen fish products export target for FY 1963 (April 1963-March 1964) at 232,300 metric tons valued at US\$80.4 million. At that meeting, industry members on the Committee are reported to have urged the Japanese Government to establish adequate Government facilities for studying the occurrence of green meat in frozen tuna or, as an alternative measure, subsidize private organizations to conduct this study.

At another meeting (March 22) between MITI and the same Export Committee the export targets for canned food products were discussed. Following the meeting, MITI recommended an export target of 15,792,000 cases (valued at US\$158 million).

The proposed export targets for canned and frozen fish products recommended by MITI were to be submitted to the Supreme Export Trade Council (headed by the Prime Minister), which was expected to act on the recommendation in April.

Together with the proposed export targets, MITI was reported to be planning on submitting to the Council the following proposals in regard to canned fish products:

(2) Seek to have the United States eliminate the present limitations placed by her on the amount of canned tuna in brine that can be imported under the 12.5 percent (ad valorem) rate. (Note: At present, imports into the United States not in excess of 20 percent of the United States domestic pack of canned tuna during the preceding calendar year are dutiable at 12.5 percent ad valorem. Imports in excess of 20 percent of the United States pack are dutiable at 25 percent ad valorem.

Table 2 - Japanese Canned Fishery Products Export Target for Fiscal Year 1963

Product	FY 1963		FY 1962 ^{1/}	
	Export Target Qty.	Value ^{2/}	Actual Export Qty.	Value ^{2/}
	1,000 Cases	US\$ 1,000	1,000 Cases	US\$ 1,000
Tuna	4,250	34,912	3,924	32,121
Salmon	1,710	51,124	2,046	70,967
Crab	440	11,077	459	11,331
Sardine	500	3,625	182	1,440
Saury	1,370	7,773	1,089	6,369
Mackerel	562	3,398	417	2,860
Shellfish	1,855	14,527	1,684	12,578
Other ^{3/}	5,105	31,520	5,198	31,348
Total	15,792	157,956	14,999	169,014

^{1/}Figures for FY 1962 are estimates.

^{2/}Based on f.o.b. prices in Japan.

^{3/}Mainly canned mandarin orange.

Japan (Contd.):

(3) Seek to include as payment for reparations to the Philippines, Burma, and Indonesia, the following canned fish products: Sardine, saury, jack mackerel, squid, and salmon (particularly pink salmon). (Suisan Keizai Shimbun, March 21 and 24; Suisan Tsushin, March 25, 1963.)

INCREASE OF EXPORTS OF CANNED SHRIMP PROPOSED IN FY 1963:

Four large Japanese fishing companies have submitted a request to the Japanese Ministry of Agriculture and Forestry to place canned shrimp on the list of marine products under export control. The Ministry is expected to consider this request at the Export Marine Products Promotion Deliberation Council meeting scheduled to be held in June or July 1963.

According to the request submitted to the Ministry, the canned shrimp production target for FY 1963 (April 1963-March 1964) would be set at 620,000 cases (converted to 24 7-oz.

Japanese Canned Shrimp Exports, Fiscal Years 1960-62			
Destination	Quantity		
	1962	1961	1960
	(Actual Cases)		
United States	169,284	26,512	2,004
Canada	71,446	16,130	384
United Kingdom	88,102	10,056	2,944
Others	25,020	11,058	6,880
Total quantity	353,852	63,756	12,212
Total value	\$2,377,408	\$473,858	\$106,433

cans/cs.), of which 600,000 cases would be exported (United States and Canada, 440,000 cases; Great Britain, 120,000 cases; other countries 40,000 cases).

Exports of canned shrimp increased sharply from only 12,212 cases valued at \$106,433 in fiscal year 1960 to 353,852 cases valued at \$2,377,408 in the fiscal year ending March 31, 1963. (Suisan Tsushin, March 30, 1963.)

FISHERIES LABORATORIES AND EDUCATIONAL INSTITUTIONS:

Two University of Kentucky professors travelling in Japan under a United States Agency for International Development contract have reported on the fisheries laboratories and fisheries educational institutions as follows:

"Japan is the leading fishing nation of the entire world. It is natural, therefore,

that the participants had high expectations and in visiting this country they were not disappointed. Of the many fishery installations visited, only those which especially stand out in the mind of the writer are described.

"I. Pearl Research Laboratory: This laboratory is located in Kashiko-jima in Mie Prefecture. It was established by the Ministry of Agriculture and Forestry in 1955 for the purpose of promoting the pearl culture industry. Although pearl farms occur in nearly 30 prefectures, the center of the industry has its location in the area of Mie Prefecture. At the present time there are over 3,000 pearl farms in Japan which com-



Pearl oyster rafts.

prise a total area of over 12,000 hectares (29,652 acres). Approximately 200 million pearl oysters (*Pinctada martensii*) are utilized each year for pearl culture purposes. The annual value of cultured pearls exported from Japan closely approaches \$36 million.

"The present method of culturing pearls involves the insertion of a foreign particle or nucleus, usually a perfectly spherical bit of mussel shell, along with a small piece of living mantle tissue in the body of the oyster. The transplanted mantle tissue then grows around the nucleus thereby forming a saclike structure which subsequently secretes successive layers of mother of pearl (nacre) upon the nucleus. One year is sufficient for production of small pearls, but longer periods are required for larger ones. In general, pearls are not gathered until the nacre layer surrounding the nucleus is at least ten percent greater than the original diameter of the nucleus.

Japan (Contd.):

"One of the most interesting developments in this field is the discovery that certain fresh-water species of mussels possess the characteristics of producing an excellent quality of pearl. Since various ecological and environmental factors affecting the growth of aquatic animals can be controlled more easily in small fresh-water ponds than in the sea, it is quite possible that this method will become more prominent in the future.

"II. Tokai Regional Fisheries Research Laboratory: This facility was established in 1949 with the major purpose of promoting the development of marine fisheries. Major sections or divisions in which research studies are being conducted are Marine Resources, Population Dynamics and Statistics, Oceanography, Marine Propagation, Fishing Gears and Methods, Fish Preservation, Marine Products Utilization, Biochemistry, and Hydrology. Each of the major divisions listed above are staffed with extremely qualified personnel, most of whom have a degree of Doctor of Science or Doctor of Agriculture. Also, the Laboratory is equipped with the most modern scientific instruments. In addition, there are three oceanographic vessels, two of which exceed 200 tons in size. Two more specific examples of projects which are being carried out are (1) biological and oceanographical researches into marine resources, and the population dynamics thereof, to determine the maximum sustained productively that can be utilized without risking the danger of depleting the resource; and (2) research into the theory and practice of processing fish flesh into preservable food, extraction of vitamins, and utilization of wastes for animal foods. Needless to say, the quality of research conducted at this station is excellent.

"III. Technical Fisheries High School: This school is located at Misaki and it is supported and operated by the prefecture in which it is located. At present there are 350 students enrolled, but this will be increased to 600 as soon as construction of additional building is completed. The regular course extends over a period of three years, but an additional two-year special course of training is available for those qualified and interested in specializing in more responsible positions such as boat captain etc. Although students are accepted from all over Japan, they all must have completed Junior High School. The school is staffed with approxi-

mately 50 professional teachers. The facilities available at this institution leave little to be desired. Some of the facilities include: a training ship (160 tons) fully equipped with fishing gear and another larger ship now under construction, a walk-in quick freeze and cold-storage rooms, a large ice plant, a complete canning plant to process and can fish which are taken during the training cruises, a large machine shop, and a mock-up or demonstration fishing vessel class room in which all major power components of a ship are actually installed and operate. The writer was impressed with the high level of training attained by these teen-age lads. Again, it is not difficult to understand why Japan is the leading fishing nation.

"IV. Tokyo University of Fisheries: In Japan there are at least 13 institutions which offer degrees in fisheries. However, the Tokyo University of Fisheries, by far, offers the most thorough and varied training. This institution has a total of 250 faculty or staff members and approximately 1,000 students. Competition among students is keen. Severe selection of high school graduates applying for admission to this university is practiced--out of every 7 applicants only 1 is accepted.

"This University has three faculties: (1) Faculty of Fishing, (2) Faculty of Technology, and (3) Faculty of Pisciculture. Generally speaking, all students take general education and basic science courses for the first two years after which they may select their area of specialization (one of the three faculties). Students who successfully complete the regular four-year course are awarded the degree of Suisan Gakushi (Bachelor of Fisheries). Also, a limited number of graduates may take a one-year post graduate course, but no advanced degree or title is given for this extra period of study. The facilities of this university are similar in nature to those listed for the Technical Fisheries High School, but much greater in scope. For example, there are three training ships, the largest of which exceeds 1,000 tons. In addition, the three faculties have six different training stations which are staffed and equipped to train students in the fields of fishing, manufacturing, or marine and freshwater fish culture. The fisheries library at this institution contains over 80,000 books and journals. The institution regularly publishes (six issues per year)--The Journal of the Tokyo University of Fisheries which consists of research studies con-

Japan (Contd.):

ducted by the staff." (United States AID, Regional Branch, Tokyo, April 4, 1963.)

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FISH-MEAL FACTORYSHIP
TO OPERATE IN BERING SEA:

The Japanese fish-meal factoryship Gyokuei Maru (10,350 gross tons) departed for the eastern Bering Sea on April 10, 1963, from Hakodate, Japan. The 30 catcher vessels assigned to that factoryship left Japan on April 6. Production target of the fleet is 10,800 metric tons of fish meal. (Nihon Suisan Shimbun, April 12, 1963.)

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PRODUCTION OF FISH SAUSAGE
AND HAMS, 1962:

The Japanese Fish-Meat Sausage Association with 70 manufacturing members announced in March, that the production of fish hams and sausages in 1962 amounted to 101,907 metric tons, 11.9 percent more than in 1961. Prior to 1962, production of fish hams and sausages had increased about 20-30 percent annually. In 1962, 76,008 tons of fish sausage and 25,899 tons of fish hams were produced. (Japanese newspaper, March 21, 1963.)

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IMPORTS OF SOVIET-
PRODUCED HERRING INCREASED:

An agreement between Japan and the Soviet Union calls for the importation of 1,500 metric tons of Soviet herring in 1963. This is an increase in imports of 400 tons over 1962 and the largest amount since Japan first purchased Russian herring 4 years ago. Under the contract negotiated in Moscow by the Japanese trade delegation, which included representatives of the Federation of Hokkaido Fisheries Cooperatives, Japan will pay US\$95 a ton for fresh herring and \$117.50 a ton for salted herring, port of delivery Soviet Union.

The new agreement was the result of an offer made by the Soviet Union to increase her herring export quota, following conclusion of a 700-ton export agreement with Japan in September 1962. The fisheries cooperatives planned to dispatch a fleet of small freezerships to the Soviet Union in May this

year to transport the herring back to Japan. (Suisan Keizai Shimbun, April 10, 1963.)

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PERMISSION SOUGHT TO FISH
EXPERIMENTALLY FOR
KING CRAB IN GULF OF ALASKA:

Eight Japanese fishing companies have filed applications for experimental fishing for king crabs in the Kodiak Island area in the Gulf of Alaska. Experimental fishing on a small scale was permitted south of the Alaska Peninsula by the North Pacific Fisheries Commission in the fall of 1962. Exploratory bottomfish fishing is authorized for the Akebono Maru No. 51.

In the Gulf of Alaska, "box-net" fishing gear is the only type of gear permitted for king-crab fishing under Canada's fishing regulations. The Japanese consider this gear inefficient, but have now decided to fish for king crab experimentally provided one or more of the applications are approved. (Suisan Tsushin, March 27, 1963.)

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NEW MARINE RESOURCES
PROTECTION ASSOCIATION:

The Japanese Fisheries Agency has revealed plans to establish a Government-sponsored foundation to promote the principle of the conservation of marine resources. There are several conservation organizations sponsored by civilians. Existing organizations concerned with conservation are being consolidated with the new organization. The exception is the Salmon Resources Protection Association which is continuing to work separately but is joining in the new organization as an important constituent. The Government will contribute ¥20,000,000 (US\$55,555) to the foundation and the same amount is being contributed by industry.

On March 22, the second foundation committee meeting was held under the chairmanship of the Japanese Fisheries Society. An authoritative Fisheries Agency official predicted that the Japanese Marine Resources Protection Association will be founded about the middle of April. (Japanese newspaper, March 25, 1963.)

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Japan (Contd.):

SALMON FISHERMEN'S ASSOCIATION TO SEND MISSION TO UNITED STATES AND CANADA:

The Nikkeiren, a Japanese association of high seas salmon gill-net fishermen attached to motherships, has decided to send a two-man mission to the United States and Canada in order to explain the Association's views of the high seas salmon fishery to the public of those countries. The views emphasize, in particular, that the Association does not favor unrestrained salmon fishing even if salmon is removed from abstention in the North Pacific Fisheries Convention.

The mission was expected to start on the tour late in May and a representative of Japan Seamen's Union will be included. The tour is scheduled to include a study of the United Kingdom's market for canned red salmon. (Japanese newspaper, March 25, 1963.)

NEW SPONGE SUPPLIERS SOUGHT:

Greek sources have announced that three metric tons of Italian sponges were unloaded in Japanese ports during December 1962 and January 1963. This was said to be the first time that Italian sponges had made a direct appearance on the Japanese market. It was also reported that Japanese sponge merchants had passed through Greece on their way to Turkey, Syria, and Lebanon, where they were seeking sponges for direct shipment to Japan. (Alieia, March 1963.)

VESSELS ASSIGNED FOR RESEARCH ON SALMON AND KING CRAB:

The Japanese Government plans to assign a total of 17 vessels to the Okhotsk Sea, Japan Sea, Bering Sea, and the North Pacific Ocean (including the Gulf of Alaska) to con-

duct biological investigations on salmon and king crab. The fleet of 17 vessels will be made up of research and training vessels belonging to the national research laboratories, fisheries colleges, and prefectural fisheries high schools. Sixteen of the vessels are to be assigned to salmon research and one to king crab studies in the Okhotsk Sea. Data collected by those vessels are to be submitted to the International Northwest Pacific Fisheries Commission (Japan and Soviet Union). (Minato Shimbun, April 12, 1963.)

JOINT SALES GROUP CONSIDERED FOR MARKETING WHALE OIL:

Six Japanese fishing companies engaged in the production of whale oil are studying the possibility of forming a joint sales company for the purpose of maintaining orderly marketing of whale oil abroad. At their recommendation, the Japanese Government had designated whale oil as one of 13 fishery products whose exports would be regulated (beginning April 1, 1963) so as not to disrupt overseas market conditions.

Annual whale oil production in Japan is reported to be around 150,000 metric tons, of which 75-80 percent is exported. (Minato Shimbun, March 27, 1963.)



Republic of Korea

FISHERIES TRENDS, MARCH 1963:

The United States Overseas Mission-supported Fish Marketing Center in Pusan was about completed as of March 15, 1963, but the dock providing the only approach was in a state of extreme disrepair. Delays in the financing of a new dock have necessitated continued use of the present facility.

The Korean Fisheries Experiment Station is very successfully channeling its findings into private industry and the cooperatives. Eight shrimp-packing plants are already earning substantial amounts of foreign exchange. (United States Embassy, Seoul, March 15, 1963.)



Typical Japanese king-crab mothership and trawlers.

Latvia

WHALE MEAT USED FOR MAKING SAUSAGES:

Sausages made from Antarctic whale meat are now being produced in Latvia. Three types are being prepared; cooked, half-smoked, and liver. Beef, pork, and fat are blended with the whale meat in the production of the sausages. (Sovetskaya Latvia, April 12, 1963.)



Mexico

BAJA CALIFORNIA LANDINGS OF SPINY LOBSTERS, 1962/63 SEASON:

The "legal" landings of spiny lobsters (whole) in Baja California for the season beginning October 1, 1962, and ending March 15, 1963, amounted to about 1.7 million pounds. The "legal" landings do not include landings retailed directly by the fishermen and by some of the fishery cooperatives who are not members of the Federacion Regional de Sociedades Cooperativas de la Industria Pesquera which has 11 members.

The "legal" landings this past season amounted to 1,673,443 pounds and included 1,371,762 pounds of medium (medida), 184,280 pounds of large (burro), 73,391 pounds of extra large (caballon), 8,117 pounds of small, and 35,893 pounds of dead (muerto) spiny lobsters. In the 1961/62 season the legal production amounted to 1,561,054 pounds. (United States Consul, Tijuana, April 4, 1963.)



Mozambique

IMPORTS OF FISHERY PRODUCTS, 1961-1962:

Mozambique's imports of fishery products in 1962 were up 6.4 percent in quantity and

9.7 percent in value from those in the previous year. Imports of canned fish showed the greatest increase in both quantity and value in 1962. (United States Consulate, Salisbury, March 22, 1963.)



Netherlands

ANTARCTIC WHALING RESULTS, 1962/63 SEASON:

The management of the Netherlands Whaling Company in Amsterdam has released preliminary production data for its 1962/63 Antarctic whaling expedition which was headed by the factoryship Willem Barendsz. They stated

Netherlands Whaling Company Production in Antarctic, 1961/62 and 1962/63 Seasons		
Product	Season	
	1/1962/63	1961/62
	... (Metric Tons) ...	
Whale oil	10,527	12,155
Sperm oil	2,927	2,918
Meat meal	1,275	1,726
Frozen meat	1,108	1,582
Meat for Japanese refrigerating ship	7,284	7,932
1/Preliminary.		

that although the expedition took several very large whales, the final results were disappointing since the number of units caught were below the maximum allowed. The captain of the Willem Barendsz reported that only 20 blue whales were caught and that they seemed to be exceedingly scarce. (United States Consulate, Amsterdam, April 25, 1963.)

Note: See Commercial Fisheries Review, July 1962 p. 87.



Nigeria

IMPORTS OF CERTAIN FISHERY PRODUCTS, 1961 AND JANUARY-OCTOBER 1962:

Imports of fishery products (fresh and frozen, cured, and dried) amounted to about 66.2

Mozambique's Imports of Fishery Products, 1961-1962

Product	1962			1961		
	Quantity	Value		Quantity	Value	
	1,000 Metric Tons	1,000 Contos	1,000 U.S. Dollars	1,000 Metric Tons	1,000 Contos	1,000 U.S. Dollars
Sardines . . . . .	.9	13.5	467.9	.8	11.6	402.1
Other fishery products:						
Fresh fish	1.3	11.4	395.1	1.1	9.4	325.8
Canned fish	1.4	22.3	773.0	1.1	16.8	582.3
Cured fish	6.8	55.2	1,913.3	6.8	54.4	1,885.6
Dried cod fish	1.3	23.7	821.5	1.2	22.7	786.8
Total imports of fishery products	11.7	126.1	4,370.8	11.0	114.9	3,982.6

Note: Mozambique conto equals US\$34.66.

Nigeria (Contd.):

Imports of Certain Fishery Products by Nigeria, 1961 and January-October 1962

Type of Product	January-October 1962			1961		
	Quantity	Value1/		Quantity	Value1/	
	1,000 Lbs.	NL	US\$1,000	1,000 Lbs.	NL	US\$1,000
Fresh and frozen	2,630	109,985	308	4,380	234,561	657
Salted, dried, and smoked	276	18,056	51	378	27,771	78
Stockfish	58,075	5,914,982	16,562	61,440	7,564,055	21,179

1/One Nigerian pound equals US\$2.80.

million pounds valued at US\$21.9 million in 1961. Most of the fresh and frozen fish was imported from the Soviet Union (probably landed in part at Nigerian ports by Soviet vessels), and the cured products largely from Norway and Iceland. The most important item was stockfish. The import trade in cured fishery products (smoked, salted, and air-dried) is partly through large importing firms and partly through hundreds of small and medium-size firms able to engage in this type trade without expensive storage facilities. (United States Embassy, Lagos, April 6, 1963.)

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MARKET FOR CANNED FISH:

A report by the Australian Trade Survey Mission to West Africa states that there are good prospects in Nigeria for marketing canned fish.

Canned fish may be freely imported under open general licenses and foreign exchange is available. Imports are financed on irrevocable letter of credit terms, and on sight draft terms where principals are well known. The Nigerian pound is on parity with sterling. (Fisheries Newsletter, April 1963.)

**Norway****FISHERY PRODUCTS EXPORTS
WORLD'S SECOND HIGHEST IN 1961:**

Norway in 1961 earned more money from export of fish and fish products than any other country except Japan, according to an April 29, 1963, report by the Food and Agriculture Organization (FAO).

According to FAO, the Norwegians exported 455,900 metric tons valued at about \$139 million. Those earnings were second only to the \$188.2 million that Japan, the world's leading fishing nation in both total

catch and exports, earned from fishery exports of 415,700 tons. The higher Japanese earnings on less weight were largely accounted for by exports of good quality Japanese-caught frozen and canned tuna.

Although Norway in 1961 ranked only sixth in national catch--1.5 million tons as compared to Japan's 6.7 million tons or Peru's 5.2 million tons--the Norwegians have long been leaders in international trade in fish and fish products. The Norwegians normally export half or more of their annual catch.

Fresh, chilled or frozen fish led Norway's fish exports by weight in 1961 (101,700 tons valued at \$31.4 million), but dried, salted, or smoked fish (74,600 tons valued at \$39.9 million), carried the greater value.

The balance of Norway's 1961 fish exports were made up of crustaceans and molluscs (6,600 tons valued at \$9.8 million); fish products and preparations (38,300 tons valued at \$20.7 million); oils and fats of aquatic origin (106,300 tons valued at \$21.7 million); and fish meals for animal feeding (128,400 tons valued at \$15.5 million).

In 1958, Norway exported 566,400 tons of fishery products valued at \$148.5 million and in 1959, 558,900 tons valued at \$151.8 million. Norway's record year for exports of fishery products was 1957 when 644,400 tons was exported valued at \$164.4 million which exceeded Japan's exports in both tonnage and value.

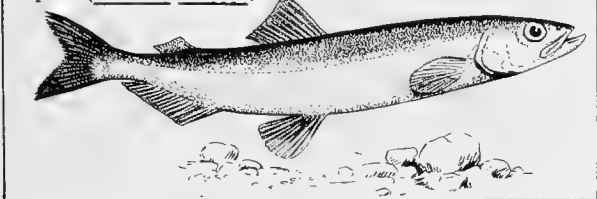
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FISHERY TRENDS, APRIL 1963:

Lofoten Cod Fishery: The cod fishery in the Lofoten waters of Norway yielded a total catch of only 28,302 metric tons during the 1963 season, as compared to 38,850 tons in the previous season. The ex-vessel value of the 1963 catch amounted to Kr. 35 million (US\$4,895,000). A total of 22,620 tons of the 1963 catch was being sun-dried in the open air. The dried cod will be sold as stockfish.

Norway (Contd.):

Capelin Fishery: Toward the end of the Lofoten season, some of the cod fishermen sailed northward to Finnmark to try their luck in the coastal fishery for capelin which is used by fish-oil reduction plants. The fishery was very poor until the end of April 1963 when large schools of capelin were found. In the

Capelin (*Mallotus villosus*)

course of a few days, some 70 vessels landed about 4,000 tons of capelin. It was expected that some 50 purse seiners would enter the fishery if the good catches were maintained. (News of Norway, May 2, 1963.)

Note: Norwegian kroner 7.15 equals US\$1.00.

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PRODUCTION FROM 1962/63 ANTARCTIC WHALING SEASON SHARPLY LOWER:

Production (preliminary data) of whale and sperm oil from the 1962/63 Antarctic whaling season by Norway's 4 whaling fleets amounted to 183,345 barrels of whale oil and 41,300 barrels of sperm oil. In the 1961/62 Antarctic whaling season, Norway's 7 whaling fleets produced 498,717 barrels of whale oil and 19,587 barrels of sperm oil.

Production of whale and sperm oil by the 4 other nations participating in the 1962/63 Antarctic whaling season were: United Kingdom 67,260 barrels of whale oil and 13,100 barrels of sperm oil; Japan 666,336 barrels of whale oil and 48,682 barrels of sperm oil; U.S.S.R. 329,127 barrels of whale oil; and Netherlands 54,397 barrels of whale oil. Production of whale oil by the U.S.S.R. and the Netherlands is estimated on the basis of the 1962/63 catch of blue-whale units and the 1961/62 oil yield per blue-whale unit. The production of sperm oil by the U.S.S.R. and Netherlands Antarctic whaling fleets was unavailable as of April 18. (United States Embassy, Oslo, April 18, 1963.)

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WHALE OIL PRODUCTION (ANTARCTIC) SOLD IN ADVANCE:

Norwegian expeditions produced 30,557 metric tons of whale oil during the 1962/63

Antarctic season. Of that production, 30,000 tons had been sold in advance for Kr. 36 million (US\$5,035,000). In addition to whale oil, the Norwegian Antarctic expeditions in 1962/63 produced 6,883 tons of sperm oil, 21,744 tons of frozen whale meat, and 2,860 tons of whale meal. (News of Norway, April 25, 1963.)

Note: Norwegian kroner 7.15 equals US\$1.00.



Okinawa

LICENSES GRANTED TO IMPORT TUNA VESSELS FROM JAPAN:

According to the Japanese press, the Government of Okinawa on February 28, 1963, issued vessel import licenses to Okinawa fishing firms, authorizing them to import tuna-fishing vessels from Japan. The import licenses were granted following the Japanese Government's decision to approve the export of tuna vessels totaling 2,250 tons to Okinawa. The Okinawan firms are expected to purchase a total of 7 fishing vessels. It is reported they have already signed purchase contracts for 3 Japanese tuna vessels and are expected to sign for 2 more vessels.

Included among the fishing vessels so far contracted for export to Okinawa are the Sasshu Maru (490 gross tons) and the Iijima Maru (359 gross tons). Another tuna vessel (285 gross tons) is also scheduled to be constructed for export to Okinawa. The Okinawan fishing firms are reported planning to operate most of the newly acquired tuna vessels in the Atlantic Ocean. Their catches are expected to be delivered to Japanese trading firms for export primarily to Italy and the United States. (Suisan Tsushin, April 9, 1963.)



Panama

SPINY LOBSTER EXPLORATORY FISHING PROJECT CONTINUED:

M/V "Pelican" Cruise 10 (February 19-March 8) and Cruise 11 (March 19-April 3, 1963): The one-year survey for stocks of spiny lobsters along the Caribbean and Pacific Coasts of Panama, which was initiated late in August 1962, was continued in March and April this year by the chartered commercial fishing vessel Pelican. The survey is being conducted by the U. S. Bureau of Commercial Fisheries through an interagency

Panama (Contd.):

agreement with the U. S. Agency for International Development (AID) Mission to Panama as part of the Alliance for Progress Program.

Objectives of March-April 1963 cruises were: (1) reassess the potential of areas of the Chiriqui Gulf on the Pacific Coast where earlier explorations had resulted in good catches, and (2) spread exploratory coverage from those areas to other portions of the Chiriqui Gulf. In addition, a few traps were set in the Gulf of Panama for comparisons. Catch rates varied during the cruises from 0 (in the Gulf of Panama) to slightly over 1 lobster per 2 trap-days effort (near the Paridas Islands, Gulf of Chiriqui). Catch rates in the Gulf of Chiriqui were not as high as those in the same areas during Pelican Cruise 7 (October-November 1962). This may indicate the possibility of seasonal fluctuation in spiny lobster availability. Wood slat traps continued to outfish either reed or wire traps by wide margins, and best fishing was again experienced during dark-of-the moon periods.



Full starboard view of the M/V Pelican at the dock.

Cruise 10: A total of 509 spiny lobsters was taken from 860 traps that were successfully fished--a total of 2,477 trap days at 156 stations. The best catch, achieved during a short period of simulated-commercial trap fishing near the Paridas Islands was 19 spiny lobsters from 30 trap-days effort. In addition to the trap catches, 7 trawling stations yielded catches of 11 spiny and 5 rock lobsters, and 7 lobsters were taken during one diving station.

Male spiny lobsters continued to outnumber females by roughly 2:1, and remained larger and heavier. Average males weighed 20 ounces and measured 88 millimeters (3.5

inches) in carapace length, whereas average females weighed 12 ounces and measured 72 millimeters (2.8 inches). Sampling showed, however, that 33 percent of the female weight was tail meat, as against only 26 percent of the male weight. Wood slat traps continued to outfish wire traps by nearly 3:1 and reed traps by nearly 4:1, and showed only slight wear after 6 months of fishing effort, while the reed traps were beginning to deteriorate seriously and the wire traps have become badly misshapen. The covering growths of barnacles and other marine organisms on the wood traps seemed to improve their fishing effectiveness.

Cruise 11: A total of 174 spiny lobsters was taken from 642 traps that were successfully fished for 1,259 total trap days at 132 stations in the Gulf of Chiriqui. Individual sets of traps were fished for periods varying from 1 to 4 days. Short sets yielded best catches per trap hour. The best catch consisting of 51 lobsters came from a 3-day set of 30 wood traps near the Paridas Islands during simulated commercial fishing trials. An 83-trap, 3-day set in the Gulf of Panama was unproductive.

During simulated commercial fishing operations, traps were joined in strings of three with 15-fathom connecting lines. This decreased setting and hauling times to where 60 traps could be set in 15 minutes and hauled in 90 minutes, but it increased chances of trap loss. Results of experiments wherein the number of traps per area was increased from the usual 150-250 square foot spacing did not show increased catch rates from greater trap concentration. Sex ratios and average weights, sizes, and yields were equivalent to those indicated for Cruise 10. Ten additional spiny lobsters (Panulirus gracilis) and 11 rock lobsters (Scyllarides sp.) were taken during 9 trawl drags.

Note: See Commercial Fisheries Review, January 1963 p. 109 and April 1963 p. 71.



Peru

FISH MEAL AND OIL
INDUSTRY TRENDS, 1962:

In 1962, fish meal became Peru's most valuable export. During 1960 and 1961, fish meal shipments ranked fourth by value among Peruvian exports. The combined value of exports of all types of fishery products accounted for nearly 23 percent of Peru's ex-

Source: Callao Customshouse.

Peru (Contd.):

Table 3 - Peru's Exports of Inedible Marine Oils by Country of Destination, 1961-62

Commodity and Country of Destination	1962			1/1961		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		1,000 Soles	US\$1,000		1,000 Soles	US\$1,000
Whale Oil, Refined:						
United States	-	-	-	711.3	2,479.1	92.4
Total whale oil	-	-	-	711.3	2,479.1	92.4
Sperm Oil:						
United States	2,013.1	8,226.0	306.7	4,622.1	18,082.9	674.2
United Kingdom	4,860.0	17,665.9	658.7	2,427.5	8,984.3	335.0
Netherlands	1,154.9	4,011.1	149.6	1,923.4	6,260.8	233.4
Norway	1,308.3	4,559.8	170.0	-	-	-
Italy	-	-	-	89.7	322.0	12.0
Total sperm oil	9,336.2	34,462.8	1,285.0	9,062.7	33,650.0	1,254.6
Fish Oil:						
United States	2,855.8	7,173.8	267.5	1,018.5	3,315.6	123.6
Denmark	16,633.8	40,185.7	1,498.4	18,748.0	54,787.6	2,042.8
France	1,380.9	3,367.5	125.6	1,885.7	4,728.8	176.3
United Kingdom	13,556.1	31,165.1	1,162.0	3,279.4	8,846.7	329.8
Netherlands	52,194.8	119,647.8	4,461.2	43,909.4	123,194.8	4,593.4
Norway	24,977.2	58,581.3	2,184.3	11,036.7	33,916.3	1,264.6
Sweden	850.0	2,189.6	81.6	2,818.3	7,981.2	297.6
Other countries	15,520.6	48,349.6	1,802.8	19,610.0	53,980.9	2,012.7
Total fish oil	127,969.2	310,660.4	11,583.4	102,306.0	290,751.9	10,840.8

1/ Revised.

Source: Callao Customhouse.

fish meal producers), paid its members about US\$105 per short ton for fish meal. In early 1963, fish meal export prices were from \$124 to \$126 per metric ton (c.i.f. European ports).

Substantial progress was made in 1962 toward improving the quality of fish meal. A number of stick water evaporation units were installed in order to improve operating efficiency and reduce over-all production costs. Steps were taken to improve and standardize the packing of fish meal. (United States Embassy, Lima, April 15, 1963.)

Note: Peruvian soles 26.82 equal US\$1.00.

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PROPOSED TAXES ON FISH MEAL EXPORTS REVISED:

The Peruvian fish-meal industry will pay higher taxes in 1963, but the increases carry some exceptions and will probably not be as large as was previously announced. Tax provisions in Decree-Law No. 14414, dated March 4, 1963 (published in *El Peruano* on March 7), have been substituted for the 25-soles (93 U. S. cents) per short ton tax on anchoveta which was announced in late 1962 (Decree-Law No. 14265). The earlier Decree-Law was not implemented because of vigorous protests by the Peruvian fish-meal industry and a 22-day vessel tie-up by anchoveta fishermen. The vessel tie-up was not settled until the new tax law was announced.

It was estimated that the anchoveta landings tax, which has been repealed, would have added about US\$5.90 to the cost of producing a ton of fish meal. The new sliding-scale tax established by Decree-Law No. 14414 is a charge on fish meal exports which depends in part on export prices f.o.b. Peruvian ports. The new tax applies to fish meal exported after January 1, 1963.

It appears that the new law may have only increased the actual cost of exporting Peruvian fish meal by about \$1.85

a metric ton in early April 1963, when the export price was about \$103 a metric ton. (Although, under Decree-Law No. 14414, Peruvian shippers will have to pay a tax of about \$5.00 a ton on fish meal exported in April 1963, they will be entitled to a refund of about \$3.15 a ton under certain circumstances.)

Decree-Law No. 14414 requires Peruvian fish-meal shippers to pay an 11-percent tax on the difference between export prices (f.o.b. Peruvian ports) and the current base price established by Government authorities. But this charge is considered a payment on account of business and commercial profit taxes, and such payments will be refunded only if they exceed the final profit tax assessment.

The new law levies an additional tax of 6.5 percent on the difference between the selling price and the Government's base price, but this charge applies only when the selling price exceeds the base price by more than 25 percent. When the tax is applicable, however, it is not refundable. On March 1, 1963, the Peruvian Government set the fish-meal base price for export tax purposes at 1,811 soles per short ton which amounts to 1,996 soles (\$74.45) per metric ton.

The new taxes in Decree-Law No. 14414 are separate from and in addition to those export taxes established by Decree-Law No. 13825 (January 2, 1962). The taxes in both laws are computed in the same manner, except that Decree-Law No. 13825 involves higher rates--14 percent refundable charge, and 15 percent nonrefundable charge when applicable. In early April 1963, the combined rates under both laws would result in a tax on Peruvian fish-meal exports of \$13.28 per metric ton, of which \$7.14 would be refundable and \$6.14 would be nonrefundable. (United States Embassy, Lima, April 17, 1963.)

Note: Peruvian soles 26.82 equals US\$1.00.

* * * * *

U. S. VESSEL PURCHASED FOR TUNA-CANNING FACTORYSHIP:

According to a Japanese periodical, two canning firms in Peru have purchased a vessel from a United States company for \$400,000 and plan to utilize it as a tuna-canning factory-

Peru (Contd.):

ship. They plan to produce about 100,000 cases of canned tuna per month.

The vessel bought by the 2 companies has 2 precookers, 1 line for tall pound cans, can-and-case assembling machinery, etc. The tuna will be packed by hand with production estimated at 3,500 cases per day.

In addition, the vessel has quick-freezing machinery of 20 tons a day capacity and a cold-storage facility of 1,000 tons. The vessel will purchase fish every day on the fishing grounds. It was reported that for the time being the freezing equipment would not be used. (Suisan Tsushin, March 9, 1963.)



Portugal

CANNED FISH EXPORTS, 1962:

Portugal's total exports of canned fish in 1962 were slightly larger than in the previous year, due mainly to heavier shipments of canned mackerel. Although down somewhat from the previous year, canned sardines still accounted for 78.6 percent of the 1962 exports of canned fish.

Portuguese Canned Fish Exports, 1961-1962				
Product	1962		1961	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	59,102	3,110	60,538	3,186
Chinchards	2,054	108	2,282	120
Mackerel	4,258	170	1,605	64
Tuna and tuna-like	3,647	121	3,226	115
Anchovy fillets	5,832	583	5,195	519
Others	326	17	247	13
Total	75,219	4,109	73,093	4,017

Portugal's principal canned fish buyers in 1962 were Germany with 16,177 metric tons, followed by the United Kingdom with 9,652 tons, Italy with 9,507 tons, and the United States with 8,334 tons. (Conservas de Peixe, February 1963.)

CANNED FISH PACK, 1962:

Portugal's total pack of canned fish in oil or sauce in 1962 was about the same as in the previous year. A decline of 9.9 percent in the sardine pack in 1962 was offset by an increase in the packs of all other species.

Portuguese Canned Fish Pack, 1961-1962				
Product	1962		1961	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	54,632	2,875	60,616	3,190
Chinchards	2,816	148	2,252	118
Mackerel	7,566	302	3,211	128
Tuna and tuna-like	5,399	180	4,375	156
Anchovy fillets	5,244	524	4,985	498
Others	661	35	247	13
Total	76,318	4,064	75,686	4,103

The pack of mackerel more than doubled in 1962. (Conservas de Peixe, February 1963.)

CANNED FISH INDUSTRY CONCERNED OVER RISING COMMON MARKET TARIFFS:

The Portuguese canned fish industry is almost entirely dependent on exports and in recent years West Germany has been its largest customer. But Portuguese canned fish shipments to West Germany fell from 18,168 metric tons in 1961 to 15,857 tons in 1962. The market is threatened by the tariff policies of the European Economic Community (EEC), according to an editorial in the March 1963 issue of Conservas de Peixe, a Portuguese trade journal. (On July 1, 1962, Germany raised import duties on canned fish from countries outside the EEC to 17.3 percent ad valorem. At the same time, Germany reduced import duties on canned fish from EEC countries to 9.5 percent ad valorem.)

The editorial recommended that the Portuguese Government subsidize local canned fish exporters for the difference between EEC internal and external duties, pending resumption of Portuguese negotiations for association with the Common Market. (United States Embassy, Lisbon, April 26, 1963.)

FISHERY TRADE WITH SOVIET BLOC IN 1962:

Preliminary data on Portuguese exports of fishery products to several Soviet Bloc coun-

Portuguese ^{1/} Fishery Exports to Soviet Bloc Countries, 1962			
Commodity and Country of Destination	Quantity	Value	
		Esc. 1,000	US\$1,000
U. S. S. R.:			
Canned:			
Sardines	0.5	6.0	0.2
Anchovies	0.1	2.0	0.1
Rumania:			
Canned anchovies	51.4	1,170.0	40.6
Poland:			
Canned sardines	7.6	109.0	3.8

^{1/}Includes Azores Islands and Madeira Islands.

Note: Portuguese escudos 28.85 equals US\$1.00.

Portugal (Contd.):

tries in 1962 show that these were limited to small shipments of canned anchovies and sardines, most of which went to Rumania and Poland. Exports to the Soviet Bloc accounted for only a small fraction of the 75,219 metric tons of canned fish exported by Portugal during 1962. Portugal did not import fishery products from Communist countries during 1962. (United States Embassy, Lisbon, April 26, 1963.)



South Africa Republic

POWER BLOCKS FOR LAMPARA SEINING PURCHASED:

Fifty power blocks were ordered from a United States West Coast manufacturer by South African fishermen within two months of a demonstration in Cape Town harbor.

Members of one crew, in their first attempt, recovered their lampara seine net in 10 minutes compared with the usual 30 to 40 minutes, according to a South African periodical. The periodical also stated:

"It has been estimated that one man, on a slippery deck, can exert about one-third of a horsepower on a net when hauling it aboard. A crew of 10 can therefore exert about 3 hp. The horsepower exerted by the power block is about 8 and is equivalent to a crew of 24 men handling the net.

"The lampara seine net, as used by South African boats, has two 'wings' with the bag in the middle. To operate these it is necessary to install two power blocks, one forward slung from a derrick stepped on or near the mast, and the other from a derrick stepped on a kingpost just forward of the wheelhouse." (Fisheries Newsletter, April 1963.)



South-West Africa

WALVIS BAY PILCHARD FISHERY TRENDS, JANUARY 1963:

During the January meeting of the South-West African Executive Committee, a spokesman for the Walvis Bay fishing industry made representations for an increased pilchard

quota this year. He said that a temporary increase in the quota would not harm the pilchard resources off the coast, and the factories this season would be in a position to process a greater quantity of fish without having to enlarge their existing plant.

In an interview, he stated that the Executive Committee gave him a sympathetic hearing. The matter would still, he said, have to be referred to the Fisheries Advisory Board which was due to meet in Cape Town in February.

Last year the pilchard quota at Walvis Bay was 435,000 tons divided equally among the six factories.

The 1963 pilchard fishing season at Walvis Bay was expected to start during the first week of February when the first factory was to go into operation.

The Vice-Chairman of the Walvis Bay Fishing Factories Executive Committee stated that the industry expected to clear all stocks of the 1962 fish meal production by early February. All the fish oil production had already been cleared but there was still a considerable stock of unsold canned fish on hand at the end of January. However, he anticipated that most of this stock would be cleared before the main canning season started in June.

In the 1963 fishing season, production of fish meal would be stressed as all the anticipated production has already been sold. Negotiations were under way in January for the sale of the fish oil production.

The canning program in 1963 will be cut back on account of stocks already on hand and temporary poor market. (The South African Shipping News and Fishing Industry Review, February 1963.)



Sweden

FISH MEAL AND MARINE OIL INDUSTRY TRENDS, FISCAL YEAR 1962/63:

Fish Meal: The estimated Swedish supply of fish meal during fiscal year 1962/63 (July through June) was 9 percent greater than in the previous fiscal year. Imported fish meal in 1962/63 accounted for 69 percent of the total supply; over 85 percent of the supply was used for animal feed in Sweden, 14 percent

Sweden (Contd.):

was carried over, and less than 1 per cent was exported.

Table 1 - Swedish Supply and Disposition of Fish Meal, Fiscal Years 1/ 1961/62-1962/63

Item	2/1962/63	1961/62
. . . (1,000 Metric Tons) . .		
Supply:		
Stocks on hand, July 1	5.2	4.7
Production	6.0	5.5
Imports	25.0	22.9
Total supply	36.2	33.1
Disposition:		
Exports	0.3	0.3
Domestic consumption (animal feed)	30.9	27.6
Stocks on hand, June 30	5.0	5.2
1/Period from July 1 to June 30.		
2/Estimated.		

Table 2 - Swedish Imports of Fish Meal, Calendar Years, 1961-1962

Commodity and Country of Origin	1962	1961
. . . (Metric Tons) . . .		
Herring Meal:		
Norway	2,229.3	9,447.4
Denmark	635.6	730.4
Iceland	280.0	840.0
Total herring meal	3,144.9	11,017.8
Unclassified Fish Meal:		
Norway	535.9	305.0
Iceland	2,733.4	5,766.8
United Kingdom	282.9	-
United States	22.0	37.1
Chile	2,986.0	1,586.0
Peru	13,829.5	3,479.0
Denmark	143.5	20.0
Other countries	3.5	-
Total unclassified fish meal	20,536.7	11,193.9

Marine Oils: The estimated Swedish supply of edible marine oils in fiscal year 1962/63 was 17 percent below the previous fiscal year due to a drop in imports. Sweden is dependent on foreign sources for the bulk of her marine oils. In calendar year 1962, Sweden's main suppliers of marine oils were West Germany, the United States, Norway, and Iceland (table 4).

Table 3 - Swedish Supply and Disposition of Edible Marine Oils, Fiscal Years 1/ 1961/62-1962/63

Item	2/1962/63	1961/62
. . . (1,000 Metric Tons) . .		
Supply:		
Opening stocks, July 1	15.5	16.4
Production	3.0	3.0
Imports	35.0	45.2
Total supply	53.5	64.6
Disposition:		
Exports	15.5	15.9
Domestic consumption	21.0	33.2
Closing stocks, June 30	17.0	15.5
1/Period from July 1 to June 30.		
2/Estimated.		

Domestic consumption of edible marine oils in Sweden during fiscal year 1962/63 was expected to decline while exports were expected to continue at about the same level as in

Table 4 - Swedish Imports of Marine Oils, Calendar Years 1961-1962

Commodity and Country of Origin	1962	1961
. . . (Metric Tons) . . .		
Whale Oil, Raw:		
Japan	1,976.1	7,563.3
Norway	6,146.9	-
Total whale oil	8,123.0	7,563.3
Sperm Oil, Raw:		
Norway	-	58.8
United Kingdom	-	45.8
Other countries	-	2.0
Total sperm oil	-	106.6
Herring Oil, Raw:		
Norway	21.8	12.1
Denmark	507.2	2,428.6
Iceland	4,711.2	3,667.9
West Germany	-	404.3
Total herring oil	5,240.2	6,512.9
Medicinal Oils:		
Norway	1,606.5	451.0
Denmark	245.6	73.9
Iceland	225.4	41.5
Japan	36.0	18.0
West Germany	56.1	-
Total medicinal oils	2,169.6	584.4
Unclassified Marine Oils:		
Norway	254.8	1,250.1
West Germany	12,208.2	7,813.2
Denmark	557.3	860.9
United States	11,601.1	10,879.8
Iceland	2,415.9	-
Peru	5.4	2,717.5
France	-	6.5
Total unclassified marine oils	27,042.7	23,528.0

Table 5 - Swedish Exports of Marine Oils, Calendar Years 1961-1962

Commodity and Country of Destination	1962	1961
. . . (Metric Tons) . . .		
Herring Oil, Raw:		
Norway	1,629.6	1,632.0
Netherlands	-	61.5
Australia	23.3	36.8
West Germany	99.0	234.6
Denmark	-	210.0
Italy	40.9	74.7
Austria	10.2	13.6
Total herring oil	1,803.0	2,263.2
Hydrogenated Marine Fats and Oils:		
Norway	1,263.6	364.0
Denmark	2,707.0	1,177.9
Finland	351.5	727.7
United Kingdom	3,281.0	2,101.5
France	1,441.3	1,159.8
Switzerland	183.4	33.9
Austria	888.8	736.9
Jamaica	916.8	537.6
Trinidad	134.2	28.2
Morocco	432.6	556.0
Tunisia	131.0	72.2
Czechoslovakia	482.7	120.0
Hungary	300.6	-
Ireland	1,371.7	1,336.0
Belgium	25.0	150.1
Other countries	219.4	369.0
Total hydrogenated marine fats and oils	14,130.6	9,470.8
Unclassified Marine Fats and Oils:		
Norway	-	518.3
Denmark	-	302.3
Other countries	-	2.0
Total unclassified marine fats and oils	-	822.6

Sweden (Contd.):

the previous fiscal year. Sweden maintains a substantial export trade in hydrogenated marine fats and oils (table 5). (United States Embassy, Stockholm, April 11, 1963.)



Thailand

IMPORTS OF MARINE OILS, 1961-1962:

Thailand does not have a domestic marine oil industry and the country's marine oil im-

Thailand's Imports of Marine Oils by Country of Origin, 1961-1962

Commodity and Country of Origin	1962	1961
	... (1,000 Liters ^{1/}) ...	
Cod-liver oil:		
Norway	36.9	45.4
Japan	14.4	29.5
United States	12.5	15.4
West Germany	11.3	15.3
United Kingdom	1.4	18.9
Denmark	-	3.9
Netherlands	-	0.9
Total cod-liver oil	76.5	129.3
Unclassified marine oils:		
Japan	0.2	7.0
Taiwan	1.8	-
Total unclassified marine oils	2.0	7.0
Grand total	78.5	136.3

1/1,000 liters equals approximately 1 metric ton.

ports are limited mainly to cod-liver oil. (United States Embassy, Bangkok, April 12, 1963.)



U.S.S.R.

BERING SEA KING-CRAB MOTHERSHIP FISHING FLEETS, 1963:

According to a Japanese periodical, the Soviet Union is believed to be sending three fleets, including a newly built 12,000-ton mothership for king-crab fishing in Bristol Bay in 1963. Last year two Soviet fleets operated in the same area and their motherships were larger than those of Japan and more catchers were used. (Suisan Tsushin, March 24, 1963.)

FISHING ACTIVITIES OFF ATLANTIC AND GULF COASTS, MARCH-APRIL 1963:

Seven Soviet stern trawlers were sighted on April 12, 1963, in the vicinity of Block Canyon off the northeastern United States

coast, or about 70 miles south of Block Island, R. I. Five vessels were engaged in fishing and one vessel was towing another. The vessels were apparently using fine-meshed nets and taking whiting. One observed net haul was estimated to contain about 30,000 pounds of fish.

On March 19, 1963, a Soviet trawler (about 200 feet in length) was reported south of the Timbalier Bay area off the Louisiana coast. Yellow buoys were spread out in the water near the ship and what appeared to be synthetic netting was observed in the trawler's rigging.

Seven Soviet ships will soon be carrying out Soviet-Cuban fishing explorations in the Atlantic and other adjacent waters, the Havana, Cuba, radio reports. The work will be carried out under a new fishing agreement between the Soviet Union and Cuba. Under the pact, the Soviet Union also will aid in developing a fisheries school in Cuba by supplying 15 instructors and providing material and scientific equipment. (Unpublished sources and Press Reports.)

FLOUNDER STOCKS IN SOUTHEASTERN BERING SEA SURVEYED:

In February 1963, the Soviet fishery research vessel *Vitiaz* was surveying the distribution and migration of fish in the southeastern Bering Sea. Special attention was given to flounder migration into shallow waters to determine their concentrations during the spring season and to estimate this fishery's potential for future years. (Unpublished sources.)

WHALE FACTORYSHIP FISHING IN NORTH PACIFIC:

The Soviet whale factoryship *Vladivostok* and a fleet of catcher boats started fishing in the North Pacific during March 1963. The 17,000-gross-ton factoryship, manned by a crew of 400, can process both whales and fish. The whale-processing capacity is 1,700 metric tons of raw material daily; production capacity per day is 190 tons of whale oil, 72 tons of whale meal, and 45 tons of frozen whale meat. The fish-processing capacity is 500 tons of landings per day; production capacity per day is 100 tons of fish meal, 50 tons of frozen fish, 45 tons of frozen fillets,

U. S. S. R. (Contd.):

and 35 tons of fish oil. Equipped with engineering workshops and having a speed of 14 knots, the Vladivostok can operate the year round. The present trip by the vessel will last from March 1963 to November 1963. (Pêche Maritime, January 20, 1963.)



United Kingdom

ANTIBIOTIC ICE IMPROVES
QUALITY OF FISH LANDED:

A report has been issued on the laboratory tests carried out by the British Department of Scientific and Industrial Research on the fish treated with antibiotic ice during experimental trips by the Grimsby trawlers Ross Renown and Northern Sea.

The investigations show that the fish stowed for 16 days in antibiotic ice had all the quality characteristics of fish kept in ordinary ice for only 13 days. The treated fish, whether bulked, shelved, or boxed on board, generally showed a similar improvement over untreated fish of the same age.

In summarizing the results of the experiment, the report stated: "It can be said that the improvement in quality of the early-caught fish was of the order of two to three days." (Fish Trades Gazette, April 6, 1963.)

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IMPORTS OF CANNED SALMON, 1961-62:

According to the Canadian Government's fishery attache stationed in London, Great Britain's imports in 1962 of canned salmon were valued at C\$90 million. Of this amount, Japanese imports made up 79 percent, Canadian imports 11.2 percent, United States im-

United Kingdom's Imports of Canned Salmon, 1961-62		
Origin	Value	
	1962	1961
	..... (C\$1,000)	
Japan	71,184	33,438
Canada	10,050	6,684
United States	5,151	4,101
Soviet Union	3,555	1,434
Others	120	174
Total	90,060	45,831

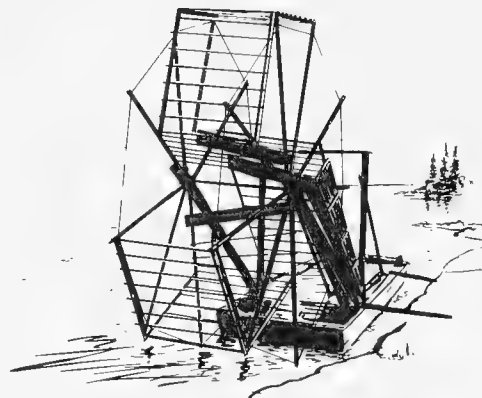
ports 5.7 percent, U. S. S. R. imports 3.9 percent, and imports from all other countries 0.1 percent. (Western Fisheries, March 1963.)



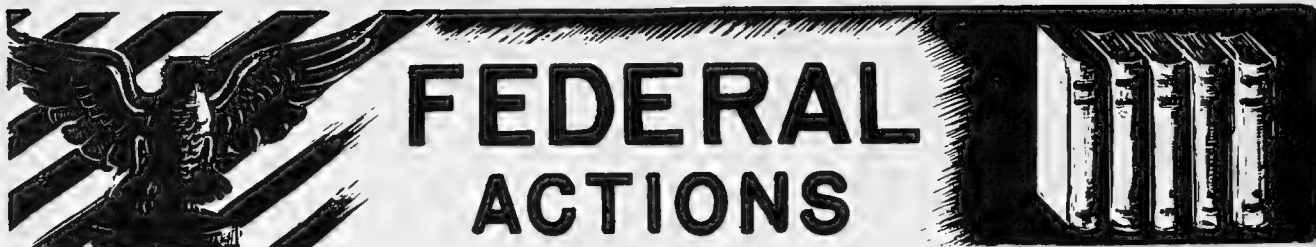
FISH WHEEL

This is a fishing device consisting of a series of lift nets attached to a circular frame operated by the current of a river. As a fish swims near the wheel, it is scooped up, slides toward the axle as the wheel turns, and is then deposited in a box or scow. Although not permitted to operate commercially, natives and traders along the Yukon and other northern rivers use them to catch their winter supply of food. This type of gear might also be called an "automatic dip net."

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



Fish wheel.



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

GRANT APPROVED FOR HARBOR IMPROVEMENTS IN NEW BEDFORD, MASSACHUSETTS:

A \$375,000 public facility grant to help the City of New Bedford, Mass., make harbor and dock improvements, has been approved by The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce.

The ARA grant and an additional \$200,000 invested by the City of New Bedford will be used to dredge a 30-foot channel, construct dock bulkheads, and fill in a 3½-acre dock site. Part of the new facility will be leased to a private firm which plans to construct a freezer-cold storage plant at the dock site. In addition, another firm is building a pet food cannery near the harbor.

The new port facilities and industrial plants are expected to contribute substantially to the general economy of the area as well as to aid the commercial fisheries. The U. S. Bureau of Commercial Fisheries cooperated with ARA and local officials by providing technical advice and assistance in developing and reviewing the project plans and proposal.

SMALL BUSINESS ADMINISTRATION

LOANS TO FISHERY FIRMS:

In early 1963, it was reported that 60 loans totaling \$4.5 million had been made to fishery products processors by the Small Business Administration (SBA) of the U. S. Department of Commerce since enactment of the Small Business Act of 1953. In addition, SBA made about 40 loans totaling \$2.8 million to wholesale and retail fish distributors.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

STANDARDS OF IDENTITY FOR FROZEN RAW BREADED SHRIMP ESTABLISHED:

In order to promote fair dealing in the interest of consumers, standards of identity have been established for frozen raw breaded shrimp by an order of the U. S. Food and Drug Administration. The notice was published in the Federal Register on May 7, 1963. The order becomes effective 60 days after its publication in the Federal Register, except as to any provisions which may be stayed by proper objections. Interested parties had until June 6, 1963, to file objections to the new standards of identity.

The Food and Drug Administration has actually established two new standards of identity--one for the article with a minimum of 50 percent of shrimp (Sec. 36.30--breaded shrimp) and one for the article with a minimum of 70 percent of shrimp (Sec. 36.31--lightly breaded shrimp). Except for the shrimp content requirement, the new standards are identical in all respects.

The new standards of identity declare that the optional forms of shrimp which may be used in preparing either type of the frozen raw breaded product are: (1) fantail or butterfly; (2) butterfly, tail off; (3) round; (4) round, tail off; (5) pieces; and (6) composite units. Labeling requirements and definitions for each optional form of shrimp are included in the standards of identity.

The new standards of identity also define the kind of batter and breading ingredients and additives that may be used in preparing the product.

A notice of proposed rule making published in the Federal Register of March 31, 1961, set forth the petition of the National Fisheries In-

stitute, Inc., and the National Shrimp Breeders Association, Inc., for the establishment of a definition and standard of identity for frozen raw breaded shrimp.

The definitions and standards of identity as published in the Federal Register follow:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 36—SHELLFISH

Frozen Raw Breaded and Lightly Breaded Shrimp; Definitions and Standards of Identity

The notice of proposed rule making published in the FEDERAL REGISTER of March 31, 1961 (26 F.R. 2722) set forth the petition of the National Fisheries Institute, Inc., 1614 20th Street NW., Washington 9, D.C., and the National Shrimp Breeders Association, Inc., 624 South Michigan Avenue, Chicago 5, Illinois, for the establishment of a definition and standard of identity for frozen raw breaded shrimp. The proposed standard of identity in that notice included a requirement that the proportion of shrimp in the finished food should not fall below 50 percent. The Commissioner of Food and Drugs has concluded that the interests of consumers will be served by establishing two standards of identity—one for the article with a minimum of 50 percent of shrimp and one for the article with a minimum of 70 percent of shrimp.

Upon consideration of the views and comments submitted and other relevant information, it is concluded that it will promote honesty and fair dealing in the interest of consumers to establish the definitions and standards of identity hereinafter set forth. Therefore, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (secs. 401, 701, 52 Stat. 1046, 1055, as amended 70 Stat. 919, 72 Stat. 948; 21 U.S.C. 341, 371) and in accordance with the authority delegated to the Commissioner of Food and Drugs by the Secretary of Health, Education, and Welfare (25 F.R. 8625): *It is ordered:*

1. That the following definitions and standards of identity be established, by adding to Part 36 the following new sections:

§ 36.30 Frozen raw breaded shrimp; identity; label statement of optional ingredients.

(a) Frozen raw breaded shrimp is the food prepared by coating one of the optional forms of shrimp specified in paragraph (c) of this section with safe and suitable batter and breading ingredients as provided in paragraph (d) of this section. The food is frozen.

(b) The food tests not less than 50 percent of shrimp material as determined by the method prescribed in paragraph (g) of this section.

(c) The term "shrimp" means the tail portion of properly prepared shrimp of commercial species. Each shrimp unit is individually coated. The optional forms of shrimp are:

(1) Fantail or butterfly: This form is prepared by splitting the shrimp. The

shrimp are peeled, except that tail fins remain attached and the shell segment immediately adjacent to the tail fins may be left attached.

(2) Butterfly, tail off: This form is prepared by splitting the shrimp. Tail fins and all shell segments are removed.

(3) Round: This form is the round shrimp, not split. The shrimp are peeled, except that tail fins remain attached and the shell segment immediately adjacent to the tail fins may be left attached.

(4) Round, tail off: This form is the round shrimp, not split. Tail fins and all shell segments are removed.

(5) Pieces: Each unit in this form consists of a piece or a part of a shrimp. Tail fins and all shell segments are removed.

(6) Composite units: Each unit in this form consists of two or more whole shrimp or pieces of shrimp, or both, formed and pressed into composite units prior to coating. Tail fins and all shell segments are removed. Large composite units, prior to coating, may be cut into smaller units.

(d) The batter and breading ingredients referred to in paragraph (a) of this section are the fluid constituents and the solid constituents of the coating around the shrimp. These ingredients consist of suitable substances which (1) are not food additives as defined in section 201(s) of the Federal Food, Drug, and Cosmetic Act; or (2) if they are food additives as so defined, they are used in conformity with regulations established pursuant to section 409 of the act. Batter and breading ingredients that perform a useful function are regarded as suitable, except that artificial flavorings, artificial sweeteners, artificial colors, and chemical preservatives, other than those provided for in this paragraph, are not suitable ingredients of frozen raw breaded shrimp. Chemical preservatives that are suitable are ascorbic acid, which may be used in a quantity sufficient to retard development of dark spots on the shrimp, and preservatives that may be used to retard development of rancidity of the fat content of the food: *Provided*, That any preservatives used to retard the development of rancidity of the fat shall not exceed 0.02 percent of the weight of the fat content of the finished food.

(e) The label shall name the food, as prepared from each of the optional forms of shrimp specified in paragraph (c) (1) to (6), inclusive, of this section, and following the numbered sequence of such subparagraph, as follows:

(1) "Breaded fantail shrimp." The word "butterfly" may be used in lieu of "fantail" in the name.

(2) "Breaded butterfly shrimp, tail off."

(3) "Breaded round shrimp."

(4) "Breaded round shrimp, tail off."

(5) "Breaded shrimp pieces."

(6) Composite units: If the composite units are cutlet-shaped, the name is "Breaded shrimp cutlets"; if stick-shaped (similar to breaded fish sticks), the name is "Breaded shrimp sticks"; if prepared

in a shape other than cutlet or stick, the name is "Breaded shrimp -----," the blank to be filled in with the word or phrase that accurately describes the shape, but which is not misleading.

In the case of the names specified in subparagraphs (1) through (5) of this paragraph, the words in each name may be arranged in any order, provided they are so arranged as to be accurately descriptive of the food. The word "prawns" may be added in parentheses immediately after the word "shrimp" in the name of the food if the shrimp are of large size; for example, "Fantail breaded shrimp (prawns)." If the shrimp are from a single geographic area, the adjectival designation of that area may appear as part of the name; for example, "Breaded Alaskan shrimp cutlets."

(f) Wherever the name of the food, as prescribed in paragraph (e) of this section, appears on the label so conspicuously as to be easily seen under customary conditions of purchase, the label shall bear a prominent statement listing the common or usual names of the optional ingredients present in the coating, and such statement shall immediately precede or follow such name, without intervening written, printed, or graphic matter. If a spice that also imparts color is used, it shall be designated as "spice and coloring," unless the spice is designated by its specific name. If ascorbic acid is used to retard development of dark spots on the shrimp, it shall be designated as "Ascorbic acid added as a preservative" or "Ascorbic acid added to retard discoloration of shrimp." If any other preservative, as provided in paragraph (c) of this section, is used, such preservative shall be designated by its common name, followed by the statement "added as a preservative."

(g) The method for determining percentage of shrimp material referred to in paragraph (a) of this section is as follows:

(1) *Equipment needed.* (i) Two-gallon container, approximately 9 inches in diameter.

(ii) Two-vaned wooden paddle, each vane measuring approximately 1 1/4 inches x 3 3/4 inches.

(iii) Stirring device capable of rotating the wooden paddle at 120 r.p.m.

(iv) Balance accurate to 0.01 ounce (or 0.1 gram).

(v) U.S. standard sieve No. 20. 12 inch diameter.¹

(vi) U.S. standard sieve, 1/2-inch sieve opening, 12 inch diameter.¹

(vii) Forceps, blunt points.

(viii) Shallow baking pans.

(ix) Rubber-tipped glass stirring rod.

(2) *Procedure.* (i) Weigh the sample to be debreaded. Fill the container three-fourths full of water at 70° F.—

¹ The sieves shall comply with the specifications for wire cloth and sieve frames in "Standard Specifications for Sieves," published March 1, 1940, in L.C. 584 of the U.S. Department of Commerce, National Bureau of Standards.

80° F. Suspend the paddle in the container, leaving a clearance of at least 5 inches below the paddle vanes, and adjust speed to 120 r.p.m. Add shrimp, and stir for 10 minutes. Stack the sieves, the ½ inch mesh over the No. 20, and pour the contents of the container onto them. Set the sieves under a faucet, preferably with spray attached, and rinse shrimp with no rubbing of flesh, being careful to keep all rinsings over the sieves and not having the stream of water hit the shrimp on the sieve directly. Lay the shrimp out singly on the sieve as rinsed. Inspect each shrimp and use the rubber-tipped rod and the spray to remove any breeding material that may remain on any of them, being careful to avoid undue pressure or rubbing, and return each shrimp to the sieve. Remove the top sieve and drain on a slope for 2 minutes, then remove the shrimp to weighing pan. Rinse contents of the No. 20 sieve onto a flat pan and collect any particles other than breeding (i.e., flesh and tail fins) and add to shrimp on balance pan and weigh.

(ii) Calculate percent shrimp material:

Percent shrimp material

$$= \frac{\text{Weight of debreaded sample}}{\text{Weight of sample}} \times 100 + 2.$$

§ 36.31 Frozen raw lightly breaded shrimp; identity; label statement of optional ingredients.

Frozen raw lightly breaded shrimp complies with the provisions of § 36.30, except that it contains not less than 70 percent of shrimp material, as determined by the method prescribed in § 36.30(g).

2. That the heading for Part 36 be changed to "Part 36—Shellfish."

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show wherein the person filing will be ad-

versely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing, and such objections must be supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

Effective date. This order shall become effective 60 days from the date of its publication in the FEDERAL REGISTER, except as to any provisions that may be stayed by the filing of proper objections. Notice of the filing of objections or lack thereof will be announced by publication in the FEDERAL REGISTER.

(Secs. 401, 701, 52 Stat. 1046, 1055, as amended 70 Stat. 919, 72 Stat. 948; 21 U.S.C. 341, 371)

Dated: May 1, 1963.

JOHN L. HARVEY,
Deputy Commissioner
of Food and Drugs.



Department of the Interior

BUREAU OF INDIAN AFFAIRS

INDIAN COMMERCIAL FISHING REGULATIONS IN ALASKA:

In a "Notice of Proposed Rule Making" (Federal Register, April 30, 1963), the Bureau

of Indian Affairs published regulations concerned with Indian and other native commercial fishing in Alaska. The "Notice of Proposed Rule Making" as it appeared in the Federal Register of April 30 follows:

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[25 CFR Part 88]

INDIAN COMMERCIAL FISHING IN ALASKA

Notice of Proposed Rule Making

Notice is hereby given that pursuant to the obligation imposed upon, and the authority vested in the Secretary of the Interior by 25 U.S.C. sections 2 and 9; 5 U.S.C. section 485; section 15 of the Act of March 3, 1891 (26 Stat. 1101; 48 U.S.C. § 358); the Presidential Proclamation of April 28, 1916 (39 Stat. 1777); section 2 of the Act of May 1, 1936 (49 Stat. 1250; 48 U.S.C. § 358a); and section 4 of the Act of July 7, 1958 (72 Stat. 339), as amended (73 Stat. 141), it is proposed to amend Part 88 of Title 25, Code of Federal Regulations. The purpose of the amendment is to govern Indian commercial fishing in Alaska.

It is the policy of the Department of the Interior wherever practicable, to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions or objections with respect to the proposed regulations, to the Commissioner, Bureau of Indian Affairs, Washington 25, D.C., within 30 days after the date of this notice in the FEDERAL REGISTER.

Part 88, Title 25, is hereby revised to read as follows:

Sec.

88.1 Purpose.

88.2 Annette Island Fisheries Reserve; definition; licenses.

88.3 Operation of fish traps by Metlakatla Indian Community.

88.4 Commercial fishing, Karluk Indian Reservation.

88.5 Enforcement; violation of regulations; corrective action.

AUTHORITY: §§ 88.1 to 88.5 issued under 25 U.S.C. secs. 2, 9; 5 U.S.C. sec. 485; sec. 15 of the Act of March 3, 1891 (26 Stat. 1101; 48 U.S.C. § 358); the Presidential Proclamation of April 28, 1916 (39 Stat. 1777); sec. 2 of the Act of May 1, 1936 (49 Stat. 1250; 48 U.S.C. sec. 358a); sec. 4 of the Act of July 7, 1958 (72 Stat. 339), as amended (73 Stat. 141)

§ 88.1 Purpose.

The purpose of the regulations in this part is to regulate Indian and other native commercial fishing in Alaska, but they shall not be construed to limit any rights of Indians or other natives of Alaska not specifically covered hereby.

§ 88.2 Annette Island Fisheries Reserve; definition; licenses.

(a) **Definition.** The Annette Island Fisheries Reserve in Alaska is defined in the Presidential Proclamation of April 28, 1916 (39 Stat. 1777), as the waters within three thousand feet from the shore lines at mean low tide of Annette Island, Ham Island, Walker Island, Lewis Island, Spire Island, Hemlock Island, and adjacent rocks and islets, located within the broken line upon the diagram attached to and made a part of said

Proclamation; and also the bays of said islands, rocks, and islets.

(b) **Licenses.** Members of the Metlakatla Indian Community, and such other Alaskan natives as have joined them or may join them in residence on the aforementioned islands, shall not be required to obtain a license to engage in commercial fishing in the waters of the Annette Island Fisheries Reserve.

§ 88.3 Operation of fish traps by Metlakatla Indian Community.

(a) **Number and location.** During 1963, and until the Secretary or his duly authorized representative determines otherwise, the Metlakatla Indian Community is permitted to operate not more than one trap per site for salmon fishing at any four of the following sites in the Annette Island Fisheries Reserve, Alaska:

(1) Annette Island at 55°15'09" north latitude, 131°36'00" west longitude.

(2) Annette Island at 55°12'52" north latitude, 131°36'10" west longitude.

(3) Annette Island at 55°02'47" north latitude, 131°38'53" west longitude.

(4) Annette Island at 55°05'41" north latitude, 131°36'39" west longitude.

(5) Annette Island at 55°01'54" north latitude, 131°38'36" west longitude.

(6) Annette Island at 55°00'45" north latitude, 131°38'30" west longitude.

(7) Annette Island at 54°59'41" north latitude, 131°36'48" west longitude.

(8) Ham Island at 55°10'13" north latitude, 131°19'31" west longitude.

(b) *Season.* Fishing for salmon with traps operated by the Metlakatla Indian Community is permitted only at such times as commercial salmon fishing with nets is permitted by order or regulation of the Alaska Board of Fish and Game for Commercial Fishing in Section 1-E of Fishing District No. 1. During any times when fishing with nets is prohibited by the State of Alaska in said Section 1-E of Fishing District No. 1 the traps shall be closed in accordance with the method prescribed in paragraph(c) (3) of this section.

(c) *Size, construction and closure—*
(1) *Size.* When any part of a trap is in a greater depth of water than 100 feet, the trap as measured from shore at mean high tide to the outer face of the pot shall not extend beyond 900 feet.

(2) *Construction.* Poles shall be permanently secured to the webbing at each side of the mouth of the pot tunnel and shall extend from the tunnel floor to a height at least four feet above the water. A draw line shall be reeved through the lower end of both poles mentioned above and the upper end of one.

(3) *Method of closing.* The tunnel walls shall be overlapped as far as possible across the pot gap and the draw line shall be pulled tight and both secured so as to completely close the tunnel. In addition, 25 feet of the webbing of the heart on each side next to the pot shall be lifted or lowered in such manner as to permit the free passage of fish.

§ 88.4 Commercial fishing, Karluk Indian Reservation.

(a) *Definition.* The Karluk Indian Reservation includes all waters extend-

ing 3,000 feet from the shore at mean low tide on Kodiak Island beginning at the end of a point of land on the shore of Shelikof Strait about 1¼ miles east of Rocky Point and in approximate latitude 57°39'40" N., longitude 154°12'20" W.; thence south approximately 8 miles to latitude 57°32'30" N.; thence west approximately 12½ miles to the confluence of the north shore of Sturgeon River with the east shore of Shelikof Strait; thence northeasterly following the easterly shore of Shelikof Strait to the place of beginning, containing approximately 35,200 acres.

(b) *Who may fish; licenses.* The waters of the Karluk Indian Reservation shall be open to commercial fishing by bona fide native inhabitants of the native village of Karluk and vicinity, and to other persons insofar as the fishing activities of the latter do not restrict or interfere with fishing by such natives. Such natives shall not be required to obtain a license to engage in commercial fishing in the waters of the Karluk Indian Reservation.

(c) *Salmon fishing; restrictions.* Commercial fishing for salmon by native inhabitants of the native village of Karluk and vicinity in the waters of the Karluk Indian Reservation shall be in accordance with the seasonal and gear restrictions of the rules and regulations of the Alaska Board of Fish and Game for Commercial Fishing in the Karluk District, except that: (1) Beach seines up to 250 fathoms in length may be used northeast of Cape Karluk; and (2) prior to July 1, fishing shall be permitted to within 100 yards of the Karluk River

where it breaks through the Karluk Spit into Shelikof Strait.

§ 88.5 Enforcement; violation of regulations; corrective action.

(a) *Enforcement.* The regulations in this Part shall be enforced by any duly authorized representative of the Secretary. Any fish trap, vessel, gear, processing establishment or other operation or equipment subject to these regulations shall be available for inspection at all times by such representative.

(b) *Violation of regulations.* Whenever any duly authorized enforcement representative of the Secretary has reasonable cause to believe any violation of these regulations relating to fish traps has occurred, he shall direct immediate closure of the trap involved and shall affix an appropriate seal thereto to prevent further fishing. The matter shall be reported without delay to the Area Director, Bureau of Indian Affairs, who shall thereupon report and recommend to the Secretary appropriate corrective action.

(c) *Corrective action.* Any violation of these regulations relating to fish traps shall be ground for the temporary or permanent closure, as the Secretary may determine, of any or all traps authorized by § 88.3(a), or the withdrawal and rescission of the right to fish for salmon with traps at any or all sites authorized thereby.

STEWART L. UDALL,
Secretary of the Interior.

APRIL 24, 1963.

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

NEW PESTICIDE-WILDLIFE LABORATORY DEDICATED:

A new U. S. Fish and Wildlife Service laboratory which may be destined to solve the pesticide-wildlife riddle and which will study diseases of wild animals, including those transmitted from animal to man, was dedicated April 25, 1963. The laboratory is at the Patuxent Wildlife Research Center, Laurel, Md.

The new facility, the Biochemistry-Wildlife Pathology Laboratory of the Bureau of Sport Fisheries and Wildlife, will accommodate a staff of scientists studying pesticide-animal relationships and wildlife disease. In recent years, those fields of research have assumed new dimensions in the conservation of natural resources. Because of the implications to human health and well-being, both are of high interest. The laboratory is the first research facility designed to determine ways and means to use chemicals without sacrificing wildlife. It has been under construction since March 1961.



The Bio-Chemistry - Pathology Laboratory at Patuxent Wildlife Research Center, Laurel, Maryland.

The Laboratory is located in a one-story building which has 25,000 square feet of floor space with an additional 14,000 square feet in the basement. The cost, without laboratory equipment but with facilities which are basic for research laboratories, was \$475,800.



White House

OFFICE OF SPECIAL REPRESENTATIVE ESTABLISHED TO IMPLEMENT TRADE EXPANSION ACT OF 1962:

The President's Special Representative for Trade Negotiations (Mr. Herter) has organized several new interagency committees to advise him in the conduct of the Trade Agreements and Adjustment Assistance Program to be carried out under the Trade Expansion Act of 1962. The Act provided for a Cabinet-level interagency committee, called the Trade Expansion Act Advisory Committee (TEAAC). This Committee is chaired by Mr. Herter. The other members are the Secretaries of State, Interior, Treasury, Defense, Agriculture, Commerce, and Labor.

Three other committees were established with representation from those same agencies. The Trade Executive Committee (TEC), chaired by Mr. Herter's deputy, Mr. Gossett, has membership at the Assistant Secretary level. This Committee will serve as the operating arm of the program. Under it is a technical-level Trade Staff Committee (TSC), chaired by an official of Mr. Herter's office and including a representative of the Tariff Commission. The Trade Staff Committee will, as its name implies, do the necessary staff work for the Trade Executive Committee. Finally, a Trade Information Committee (TIC) was set up to hold public hearings and otherwise receive the views from interested parties.

Currently representing the Department of the Interior on the operating Committees are the Deputy Under Secretary and officials of the Resources Program Staff (TSC and TIC). The U. S. Bureau of Commercial Fisheries participates by providing information and advisory services to the Resources Program Staff on matters involving trade and tariffs for fishery products.

Executive Order (11106) providing for the administration of the trade agreements program and related matters and Title 48 - Trade Agreements and Adjustment Assistance Programs, appeared in the Federal Register of April 20 and April 23, 1963, as follows:

Executive Order 11106

PROVIDING FOR THE ADMINISTRATION OF THE TRADE AGREEMENTS PROGRAM AND RELATED MATTERS

By virtue of the authority vested in me by the Trade Expansion Act of 1962 (76 Stat. 872), Section 350 of the Tariff Act of 1930, as amended (19 U.S.C. 1351), and Section 301 of title 3 of the United States Code, and as President of the United States, it is ordered that Executive Order No. 11075 of January 15, 1963 (28 F.R. 473), be, and it is hereby, amended as follows:

SECTION 1. Amend the heading of the order to read "ADMINISTRATION OF THE TRADE AGREEMENTS PROGRAM".

SEC. 2. In Section 1, substitute "Definitions. (a)" for "Definition.", and add the following new subsection (b):

"(b) As used in this order the term 'the trade agreements program' includes all activities consisting of, or related to, the negotiation or administration of trade agreements (other than treaties) concluded pursuant to the authority vested in the President by the Constitution, Section 350 of the Tariff Act of 1930, as amended, or the Act."

SEC. 3. Amend Section 2 to read as follows:

"SEC. 2. *Office of Special Representative.* (a) There is hereby established in the Executive Office of the President an agency which shall be known as the Office of the Special Representative for Trade Negotiations.

"(b) There shall be at the head of the said Office the Special Representative for Trade Negotiations provided for in Section 241 of the Act (hereinafter referred to as the Special Representative), who shall be directly responsible to the President.

"(c) There shall be in the said Office a Deputy Special Representative for Trade Negotiations with the rank of Ambassador, whose principal functions shall be to conduct negotiations under title II of the Act, and who shall perform such additional duties as the Special Representative may direct."

SEC. 4. In Section 3, amend subsection (b) to read as follows:

"(1) The Special Representative shall advise and assist the President in the administration of, and facilitate the carrying out of, the trade agreements program. In addition, the Special Representative shall advise the President with respect to non-tariff barriers to international trade, international commodity agreements, and other matters which are related to the trade agreements program."

SEC. 5. In subsection (c) of Section 3, substitute "trade agreements program" for "Act" in each place that word appears.

SEC. 6. In Section 3, delete subsection (i), redesignate subsection (h) as subsection (i), and insert the following new subsection (h):

"(h) After the President has entered into a trade agreement which provides for any new tariff concession, the Special Representative shall submit to the President, for transmission by him to each House of Congress, copies of such trade agreement, together with a draft of the statement relating thereto provided for in Section 226 of the Act. In addition, the Special Representative shall transmit to each House of Congress copies of agreements supplementary to trade agreements which do not provide for any new tariff concession, and of such other documents relating to the trade agreements program as he considers appropriate, together with a brief statement describing each such supplementary agreement or other document."

SEC. 7. In Section 3, add the following new subsection (1) at the end of the section:

"(1) The Special Representative shall prepare or have prepared for consideration by the President, in a form suitable for inclusion in title 48 of the Code of Federal Regulations, any proclamation which relates wholly or primarily to the trade agreements program. Any such proclamation shall be subject to the provisions of Executive Order No. 11030 of June 19, 1962 (27 F.R. 5847), except that such proclamation need not be submitted for approval to the Director of the Bureau of the Budget as provided in Sections 2 (a) and (b) of that order but may be transmitted directly to the Attorney General for his consideration as to both form and legality."

SEC. 8. In Section 4, redesignate subsection (f) as subsection (g), and insert the following new subsection (f):

"(f) Before making recommendations to the President under Section 242(b)(2) of the Act, the Committee shall, through the Special Representative, request the advice of the Adjustment Assistance Advisory Board, created by the provisions of Section 361 of the Trade

Expansion Act of 1962, concerning the feasibility of adjustment assistance to workers and firms."

SEC. 9. In Section 9, insert "or this order" after "the Act".

SEC. 10. Substitute "13(b)" for "12(b)" in Section 12(a), renumber Sections 11 and 12 as Sections 12 and 13, respectively, and insert the following new Section 11:

"SEC. 11. *Redelegation.* Delegations of authority made by this order to the Special Representative, the Secretary of Commerce, and the Secretary of Labor, and other assignments of authority made by this

order to the Special Representative, shall be deemed to include the power of successive redelegation."

Section 2 of Executive Order No. 11075 of January 15, 1963 (28 F.R. 473), as amended by Section 3 of this order shall be deemed to have become effective January 15, 1963; and said Executive Order No. 11075 as amended shall be codified under title 48 of the Code of Federal Regulations.

JOHN F. KENNEDY

THE WHITE HOUSE,
April 18, 1963.

Title 48—TRADE AGREEMENTS AND ADJUSTMENT ASSISTANCE PROGRAMS

NOTE: A new Title 48, captioned as set forth above, is hereby established in the Code of Federal Regulations.

This title will set out Presidential actions taken with respect to the trade agreements program and the adjustment assistance program and will establish procedures related to the operation of such programs. The trade agreements program consists of the negotiation and administration of trade agreements entered into by the President, and especially under section 350 of the Tariff Act of 1930, as amended, and the Trade Expansion Act of 1962. The adjustment assistance program consists of the furnishing of financial and other assistance to firms and workers affected by increased imports due to tariff concessions granted under trade agreements.

In particular, this title will contain the text of all Presidential proclamations under the Trade Expansion Act of 1962 affecting United States tariffs and other import restrictions. This title also will establish the procedures whereby interested parties may make oral and written presentations to the Office of the Special Representative for Trade Negotiations on proposed trade agreements, and whereby firms and workers may, after investigation by the U.S. Tariff Commission, petition for adjustment assistance to the Department of Commerce and the Department of Labor, respectively.

The procedures of the U.S. Tariff Commission under the Trade Expansion Act of 1962, with regard to negotiation of trade agreements and the provision of adjustment assistance, are set out in Parts 201, 205, 206, and 207 of Title 19 of the Code of Federal Regulations.

ESTABLISHMENT OF CHAPTER COVERING PRESIDENTIAL DOCUMENTS

Pursuant to the final sentence of E.O. 11106 (28 F.R. 3911) a new Chapter I, Subchapter A, is established in Title 48, setting for the codified text of E.O. 11075 as amended and reading as follows:

Chapter I—Presidential Documents

SUBCHAPTER A—ORGANIC ORDERS

PART 1—ADMINISTRATION OF THE TRADE AGREEMENTS PROGRAM

- Sec.
- 1.1 Definitions.
- 1.2 Office of Special Representative.
- 1.3 Functions of Special Representative.
- 1.4 Trade Expansion Act Advisory Committee.
- 1.5 Tariff Commission.
- 1.6 Secretary of the Treasury.
- 1.7 Secretary of Commerce.
- 1.8 Secretary of Labor.
- 1.9 Committees and task forces.
- 1.10 Threat of impairment of national security.
- 1.11 Redelegation.
- 1.12 References.
- 1.13 Prior bodies and orders.

DERIVATION: The text of the sections in this part are derived from the text of E.O. 11075 (28 F.R. 473), as amended. Amendments are noted following sections affected.

§ 1.1 Definitions.

(a) As used in this part the term "the Act" means the Trade Expansion Act of 1962 (Public Law 87-794, approved October 11, 1962), exclusive, however, of chapters 2, 3, and 5 of title III thereof.

(b) As used in this part the term "the trade agreements program" includes all activities consisting of, or related to, the negotiation or administration of trade agreements (other than treaties) concluded pursuant to the authority vested in the President by the Constitution, section 350 of the Tariff Act of 1930, as amended, or the Act.

AMENDMENT NOTE: In § 1.1 the section heading was amended, the text was designated paragraph (a), and paragraph (b) was added, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.2 Office of Special Representative.

(a) There is hereby established in the Executive Office of the President an agency which shall be known as the Office of the Special Representative for Trade Negotiations.

(b) There shall be at the head of the said Office the Special Representative for Trade Negotiations provided for in section 241 of the Act (hereinafter referred to as the Special Representative), who shall be directly responsible to the President.

(c) There shall be in the said Office a Deputy Special Representative for Trade Negotiations with the rank of Ambassador, whose principal functions shall be to conduct negotiations under title II of the Act, and who shall perform such additional duties as the Special Representative may direct.

AMENDMENT NOTE: § 1.2 was revised and deemed to have become effective Jan. 15, 1963, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.3 Functions of Special Representative.

(a) The Special Representative shall have the functions conferred upon him by the Act, the functions delegated or otherwise assigned to him by the provisions of this part, and such other functions as the President may from time to time direct.

(b) The Special Representative shall advise and assist the President in the administration of, and facilitate the carrying out of, the trade agreements program. In addition, the Special Representative shall advise the President with respect to nontariff barriers to international trade, international commodity agreements, and other matters which are related to the trade agreements program.

(c) As he may deem to be necessary for the proper administration and execution of the trade agreements program and of this part, the Special Representative (1) shall draw upon the resources of Federal agencies, and of bodies established by or under the provisions of this part, in connection with the performance of his functions, and (2) except as may be otherwise provided by this part or by law, may assign to the head of any such agency or body the performance of duties incidental to the administration of the trade agreements program.

(d) In connection with the performance of his functions the Special Representative shall, as appropriate and practicable, consult with Federal agencies.

(e) The Special Representative shall from time to time furnish the President lists of articles proposed for publication and transmittal to the Tariff Commission by the President under the provisions of section 221(a) of the Act.

(f) The functions conferred upon the President by section 222 of the Act are hereby delegated to the Special Representative.

(g) The functions conferred upon the President by the first sentence of section 223 of the Act are hereby delegated to the Special Representative. The Special Representative is hereby designated to perform the functions prescribed by the second sentence of that section.

(h) After the President has entered into a trade agreement which provides for any new tariff concession, the Special Representative shall submit to the President, for transmission by him to each House of Congress, copies of such trade agreement, together with a draft of the statement relating thereto provided for in section 226 of the Act. In addition, the Special Representative shall transmit to each House of Congress copies of agreements supplementary to trade agreements which do not provide for any new tariff concession, and of such other documents relating to the trade agreements program as he considers appropriate, together with a brief statement describing each such supplementary agreement or other document.

(i) The Special Representative shall make arrangements under which the committee established by § 1.4 of this part shall provide for public hearings in pursuance of the second sentence of section 252(d) of the Act. The functions conferred upon the President by the first sentence of that section are hereby delegated to the Special Representative.

(j) Advice furnished by the Secretaries of Commerce and Labor under section 351(c) of the Act shall be transmitted by the respective secretaries to the President through the Special Representative.

(k) Subject to available financing, the Special Representative may employ such personnel as may be necessary to assist him in the performance of his functions.

(l) The Special Representative shall prepare or have prepared for consideration by the President, in a form suitable for inclusion in title 48 of the Code of Federal Regulations, any proclamation which relates wholly or primarily to the trade agreements program. Any such proclamation shall be subject to the provisions of Executive Order No. 11030 of June 19, 1962 (27 F.R. 5847), except that such proclamation need not be submitted for approval to the Director of the Bureau of the Budget as provided in sections 2 (a) and (b) of that order but may be transmitted directly to the Attorney General for his consideration as to both form and legality.

AMENDMENT NOTE: In § 1.3, paragraph (b) was revised, paragraph (c) was amended, paragraph (i) was deleted, paragraph (h) was redesignated paragraph (i), and new paragraphs (h) and (l) were added, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.4 Trade Expansion Act Advisory Committee.

(a) There is hereby established the Trade Expansion Act Advisory Committee (hereinafter referred to as the Committee). The Committee shall be composed of the Special Representative, who shall be its chairman, and the following other members: the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, and the Secretary of Labor.

(b) Each Secretary referred to in paragraph (a) of this section may designate an official from his department, who is in status not below that of an Assistant Secretary of an executive or military department, to serve as a member of the Committee in lieu of the designating Secretary when the latter is unable to attend any meeting of the Committee. In corresponding circumstances the Special Representative may designate the Deputy Special Representative for Trade Negotiations, for a corresponding purpose. Except for his accountability to his designating authority, any person while so serving shall have in all respects the same status, as a member of the Committee, as do other members of the Committee.

(c) The Special Representative may from time to time designate any member of the Committee (including any person serving as a member of the Committee under the provisions of paragraph (b) of this section) to act as chairman of the Committee when the Special Representative is unable to attend any meeting of the Committee.

(d) The Committee shall have the functions conferred by the Act upon the interagency organization referred to in section 242 of the Act and shall also perform such other functions as the President may from time to time direct.

(e) The recommendations made by the Committee under section 242(b)(1) of the Act, as approved or modified by the President, shall guide the administration of the trade agreements program.

(f) Before making recommendations to the President under section 242(b)(2) of the Act, the Committee shall, through the Special Representative, request the

advice of the Adjustment Assistance Advisory Board, created by the provisions of section 361 of the Trade Expansion Act of 1962, concerning the feasibility of adjustment assistance to workers and firms.

(g) The functions conferred upon the President by the second sentence of section 242(c) of the Act, to the extent that they are in respect of procedures, are hereby delegated to the Committee.

AMENDMENT NOTE: In § 1.4, former paragraph (f) was designated paragraph (g) and a new paragraph (f) was added, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.5 Tariff Commission.

(a) The United States Tariff Commission is requested to determine the ad valorem equivalent, and, for this purpose, the authority conferred upon the President by the provisions of section 256(f) of the Act is hereby delegated to the Commission.

(b) Reports required to be made, and transcripts of hearings and briefs required to be furnished, by the Tariff Commission under the provisions of section 301(f)(1) of the Act (1) shall, in respect of investigations made by it under section 301(c)(1) of the Act, be transmitted by the Commission to the President through the Secretary of Commerce, and (2) shall, in respect of investigations made by it under section 301(c)(2) of the Act, be transmitted to the President through the Secretary of Labor.

(c) All other reports, findings, advice, hearing transcripts, briefs, and information which, under the terms of the Act, the Tariff Commission is required to furnish, report, or otherwise deliver to the President shall be transmitted to him through the Special Representative.

(d) Advice of the Tariff Commission under section 221(b) of the Act shall not be released or disclosed in any manner or to any extent not specifically authorized by the President or by the Special Representative.

§ 1.6 Secretary of the Treasury.

There is hereby delegated to the Secretary of the Treasury the authority to issue regulations, conferred upon the President by the provisions of section 352(b) of the Act.

§ 1.7 Secretary of Commerce.

The authority to certify, conferred upon the President by the provisions of Section 302(c) of the Act, to the extent that such authority is in respect of firms, is hereby delegated to the Secretary of Commerce.

§ 1.8 Secretary of Labor.

There are hereby delegated to the Secretary of Labor the authority to certify, conferred upon the President by the provisions of section 302(c) of the Act, to the extent that such authority is in respect of groups of workers, and the authority conferred upon the President by the provisions of section 302(e) of the Act.

§ 1.9 Committees and task forces.

To perform assigned duties in connection with functions under the Act or this part and as may be permitted by law, the Special Representative may from time to time cause to be constituted appropriate committees or task

forces made up in whole or in part of representatives or employees of interested agencies, or representatives of the committee established by the provisions of § 1.4 of this part, or of other persons. Assignments of personnel from agencies, in connection with the foregoing, and assignments of duties to them, shall be made with the consent of the respective heads of agencies concerned.

AMENDMENT NOTE: § 1.9 was amended, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.10 Threat of impairment of national security.

Executive Order No. 11051 of September 27, 1962, is hereby amended by striking from section 404(a) thereof the text "Section 2 of the Act of July 1, 1954 (68 Stat. 360; 19 U.S.C. 1352a)" and inserting in lieu of the stricken text the following: "Section 232 of the Trade Expansion Act of 1962".

§ 1.11 Redlegation.

Delegations of authority made by this part to the Special Representative, the Secretary of Commerce, and the Secretary of Labor, and other assignments of authority made by this part to the Special Representative, shall be deemed to include the power of successive redelegation.

AMENDMENT NOTE: Former § 1.11 was designated § 1.12 and a new § 1.11 was added, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.12 References.

Except as may for any reason be inappropriate, references in this part to any other Executive order or to the Act or to the Trade Expansion Act of 1962 or to any other statute, and references in this part or in any other Executive order to this part, shall be deemed to include references thereto, respectively, as amended from time to time.

AMENDMENT NOTE: Former §§ 1.11 and 1.12 were designated §§ 1.12 and 1.13 respectively, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

§ 1.13 Prior bodies and orders.

(a) The pending business, and the records and property, of the Trade Policy Committee, Trade Agreements Committee, and Committee for Reciprocity Information (now existing under orders referred to in paragraph (b) of this section) shall be completed or transferred as the Special Representative, consonant with law and with the provisions of this part, shall direct; and the said committees are abolished effective as of the thirtieth day following the date of E.O. 11075 of January 15, 1963.

(b) Subject to the foregoing provisions of this section, the following are hereby superseded and revoked:

- (1) Executive Order No. 10082 of October 5, 1949.
- (2) Executive Order No. 10170 of October 12, 1950.
- (3) Executive Order No. 10401 of October 14, 1952.
- (4) Executive Order No. 10741 of November 25, 1957.

AMENDMENT NOTE: Former § 1.12 was redesignated § 1.13, E.O. 11106, 28 F.R. 3911, Apr. 20, 1963.

Chapter II—Office of the Special Representative for Trade Negotiations

[Directive No. 1]

ADDITION OF CHAPTER

In Title 48 of the Code of Federal Regulations a new Chapter II is added to read as follows:

PART 201—CREATION, ORGANIZATION, AND FUNCTIONS

Sec.

- 201.0 Scope and purpose.
- 201.1 Creation and location.
- 201.2 Organization.
- 201.3 Functions.

AUTHORITY: §§ 201.0 to 201.3 issued under sec. 401, 76 Stat. 902; 19 U.S.C. 1802. E.O. 11075, as amended (Part 1 of this title).

§ 201.0 Scope and purpose.

This chapter sets out the basic terms of reference of the Office of the Special Representative for Trade Negotiations and the procedures whereby it carries out its general responsibilities under the trade agreements program. One of the primary purposes of this chapter is to inform the public of the unit in the Office known as the Trade Information Committee, the function of which is to afford an opportunity to interested parties to present oral and written statements concerning the trade agreements program and related matters.

§ 201.1 Creation and location.

(a) The Office of the Special Representative for Trade Negotiations is established as an agency in the Executive Office of the President by § 1.2 of this title.

(b) The Office of the Special Representative for Trade Negotiations is located in the Executive Office Building, 17th Street and Pennsylvania Avenue NW., Washington 25, D.C.

§ 201.2 Organization.

(a) The Office of the Special Representative for Trade Negotiations is headed by the Special Representative for Trade Negotiations provided for in section 241 of the Trade Expansion Act of 1962 (76 Stat. 878; 19 U.S.C. 1871), who is directly responsible to the President. In addition, the Office consists of the Deputy Special Representative for Trade Negotiations provided for in § 1.2 of this title, and a professional staff.

(b) Established by, and under the direction and control of, the Special Representative for Trade Negotiations are three interagency committees, the Trade Executive Committee, the Trade Staff Committee, and the Trade Information Committee, provided for in part 202 of this chapter.

§ 201.3 Functions.

(a) The Special Representative for Trade Negotiations (1) advises and assists the President in the administration of, and facilitates the carrying out of, the trade agreements program, and (2) advises the President with respect to nontariff barriers to international trade, international commodity agreements, and other matters which are related to the trade agreements program, as provided in § 1.3 of this title.

(b) The Special Representative for Trade Negotiations is Chairman of the Trade Expansion Act Advisory Committee established by § 1.4 of this title.

PART 202—ESTABLISHMENT AND OPERATION OF COMMITTEES

Section

- 202.1 Trade Executive Committee.

- 202.2 Trade Staff Committee.
- 202.3 Trade Information Committee.
- 202.4 Participation by other agencies.
- 202.5 Transfers.

AUTHORITY: §§ 202.1 to 202.5 issued under sec. 401, 76 Stat. 902; 19 U.S.C. 1802. §§ 202.1 to 202.4 also issued under secs. 9 and 11 of E.O. 11075, as amended (§§ 1.9 and 1.11 of this title). Additional authority is also cited in parentheses following provisions affected.

§ 202.1 Trade Executive Committee.

(a) There is hereby established the Trade Executive Committee, which shall consist of the Deputy Special Representative for Trade Negotiations, as chairman, and of officials, who are each in status not below that of an assistant Secretary, designated from their respective agencies by the Secretaries of Agriculture, Commerce, Defense, Interior, Labor, State, and Treasury. The Special Representative for Trade Negotiations and each Secretary may designate from his respective agency an official, who is in status not below that of a Deputy Assistant Secretary, to serve as a member of the Trade Executive Committee in lieu of the regular member when the latter is unable to attend any meeting of the Committee.

(b) The Trade Executive Committee shall—

(1) Plan, direct, and coordinate interagency activities concerning the trade agreements program and related matters;

(2) Recommend policies and actions, and transmit appropriate materials, to the Special Representative for Trade Negotiations concerning the trade agreements program and related matters, or, when appropriate, approve such policies and actions;

(3) Supervise and direct the activities of the Trade Staff Committee and the Trade Information Committee, established by §§ 202.2 and 202.3, respectively; and

(4) Perform such other functions as the Special Representative for Trade Negotiations may from time to time determine.

§ 202.2 Trade Staff Committee.

(a) There is hereby established the Trade Staff Committee, which shall consist of a chairman designated from his Office by the Special Representative for Trade Negotiations and of officials designated from their respective agencies by the Secretaries of Agriculture, Commerce, Defense, Interior, Labor, State, and Treasury, and by the Chairman of the Tariff Commission. The Special Representative for Trade Negotiations, each Secretary, and the Chairman of the Tariff Commission may designate from his respective agency an official to serve as a member of the Trade Staff Committee in lieu of the regular member when the latter is unable to attend any meeting of the Committee. The official from the Tariff Commission will be a nonvoting member of the Trade Staff Committee, and will not participate in the discussion of any policy matter or in the consideration of any report submitted by the Tariff Commission.

(b) The Trade Staff Committee shall—

(1) Obtain information and advice from agencies and other sources concerning any proposed trade agreement, and furnish summaries of such information and advice, together with recom-

mendations of action with respect thereto, to the Trade Executive Committee; (Sec. 222, 76 Stat. 875; 19 U.S.C. 1842)

(2) Review summaries of information concerning any proposed trade agreement furnished by the Trade Information Committee, and transmit such summaries, together with recommendations of action with respect thereto, to the Trade Executive Committee;

(3) Review summaries of information concerning foreign import restrictions furnished by the Trade Information Committee, and transmit recommendations of action with respect thereto, through the Trade Executive Committee to the Trade Expansion Act Advisory Committee established by § 1.4 of this title;

(4) Review reports concerning tariff adjustment submitted by the Tariff Commission, and transmit such reports, together with recommendations of action with respect thereto, through the Trade Executive Committee to the Trade Expansion Act Advisory Committee;

(5) Review all materials required by § 1.5 of this title to be furnished by the Tariff Commission to the President through the Special Representative for Trade Negotiations, and transmit such materials, together with recommendations of action with respect thereto, to the Trade Executive Committee, except as provided in subparagraph (4) of this paragraph;

(6) Recommend policies and actions to the Trade Executive Committee concerning the trade agreements program and related matters, or, when appropriate, approve such policies and actions;

(7) Keep regularly informed of the operation and effect of the trade agreements program and related matters; and

(8) Perform such other functions as the Trade Executive Committee may from time to time determine.

§ 202.3 Trade Information Committee.

(a) There is hereby established the Trade Information Committee which shall consist of a chairman designated from his Office by the Special Representative for Trade Negotiations, and of officials designated from their respective agencies by the Secretaries of Agriculture, Commerce, Defense, Interior, Labor, State, and Treasury. The Special Representative for Trade Negotiations and each Secretary may designate from his respective agency an official to serve as a member of the Trade Information Committee in lieu of the regular member when the latter is unable to attend any meeting of the Committee.

(b) The Trade Information Committee shall—

(1) Provide an opportunity, by the holding of public hearings and by such other means as it deems appropriate, for any interested party to present an oral or written statement concerning any proposed trade agreement, and furnish summaries of such hearings and other pertinent information so received to the Trade Staff Committee;

(Sec. 223, 76 Stat. 875; 19 U.S.C. 1843)

(2) Provide an opportunity, by the holding of public hearings, upon request by any interested party, and by such other means as it deems appropriate, for any interested party to present an oral or written statement concerning foreign

import restrictions, and furnish summaries of such hearings and other pertinent information so received to the Trade Staff Committee and the Trade Expansion Act Advisory Committee;

(Sec. 252(d), 76 Stat. 880; 19 U.S.C. 1882(d))

(3) Provide an opportunity, by such means as it deems appropriate, for any interested party to present an oral or written statement concerning any other aspect of the trade agreements program and related matters, and furnish summaries of pertinent information so received to the Trade Staff Committee;

(4) Issue regulations governing the conduct of its public hearings and the performance of such of its other functions as it deems necessary; and

(Secs. 223, 252(d), 76 Stat. 875, 880; 19 U.S.C. 1843, 1882(d))

(5) Perform such other functions as the Trade Executive Committee may from time to time determine.

§ 202.4 Participation by other agencies.

Each committee established by this part may invite the participation in its activities of any other agency not regularly represented thereon, when matters of interest to such agency are under consideration.

§ 202.5 Transfers.

The business pending as of the date of the abolition, and the records and property, of the Trade Policy Committee, the Interdepartmental Committee on Trade Agreements, and the Committee for Reciprocity Information are hereby transferred to the Trade Expansion Act Advisory Committee, the Trade Staff Committee, and the Trade Information Committee, respectively.

(§ 1.13 of this title)

Effective date. This chapter shall become effective on the date of its publication in the FEDERAL REGISTER.

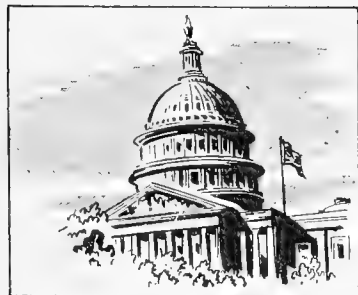
Signed at Washington, D.C., on April 20, 1963.

CHRISTIAN A. HERTER,
Special Representative
for Trade Negotiations.



Eighty-Eighth Congress

(First Session)



The House and Senate, as well as signature into law or other final disposition are covered.

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by

ANTIDUMPING ACT AMENDMENT: H. R. 5869 (Lloyd), Apr. 25, 1963; H. R. 5960 (Chenoweth), Apr. 30, 1963; H. R. 6033 (Secrest), May 2, 1963; H. R. 6087 (Morris), May 6, 1963; H. R. 6116 (McMillan), May 7, 1963; H. R. 6214 (Burton), May 9, 1963; H. R. 6293 (Knox), and H. R. 6303 (Utt), May 14, 1963; H. R. 6322 (Alger), May 15, 1963; H. R. 6409 (Collier), May 16, 1963; and H. R. 6420 (Betts), May 20, 1963, all introduced in the House, to amend the Antidumping Act, 1921; referred to the Committee on Ways and Means.

S. 1497 (Javits) introduced in Senate May 9, 1963, to amend the Antidumping Act, 1921, so as to provide protection thereunder for industries of friendly nations with which the United States has entered into trade agreements and to provide additional bases for determining the foreign market value of merchandise imported from Communist countries; referred to the Committee on Finance.

BERING SEA HALIBUT FISHERY: The East Bering Sea Halibut (Joint hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate and the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 1st Session), 334 pp., printed. Contains hearings held Feb. 14 and 15, 1963, at Seattle, Washington, and Feb. 17 and 18, 1963, in Juneau, Alaska. The hearings were concerned with the recent recommendation of the International North Pacific Fisheries Commission to open the eastern Bering Sea to halibut fishing by the Japanese. Contains the statements and communications from industry personnel, Government agencies and interested parties.

CLAM PLANTERS DISASTER LOANS: H. R. 6107 (Bonner) introduced in House May 7, 1963, to extend to clam planters the benefits of the provisions of the present law which provide for production disaster loans for farmers, stockmen, and oyster planters; referred to the Committee on Agriculture.

COLLISION AT SEA, REGULATIONS FOR PREVENTION: H. R. 6012 (Bonner) introduced in House May 2, 1963, and S. 1459 (Magnuson) introduced in Senate May 8, 1963, to authorize the President to proclaim regulations for preventing collisions at sea; referred to the Senate Committee on Commerce and the House Committee on Merchant Marine and Fisheries. Would authorize the President on behalf of the United States to proclaim the international regulations for preventing collisions at sea, 1960, on or after a date fixed by the Intergovernmental Maritime Consultative Organization for application of such regulation by governments which have agreed to accept them. Such regulations shall thereafter have effect as if enacted by statute, and be followed by all public and private vessels of the United States and by all aircraft of U.S. registry to the extent therein made applicable. However, they shall not apply to waters of the United States governed by the inland rules, the Great Lakes rules, or the western rivers rules, nor shall they apply to aircraft on any territorial water of the United States. Would repeal the existing international rules for preventing collisions at sea, 1948. Regulations were formulated at the Fourth International Conference on Safety of Life at Sea, 1960 (annex E to the final act of the International Conference on Safety of Life at Sea.)

Parts of the rules of the International Regulations for preventing collisions at sea were rewritten. Those which apply directly to fishing vessels are:

Rule 9. This rule has been completely rewritten to require vessels engaged in trawling to show a distinctive signal consisting of a green light over white visible all round the horizon and vessels engaged in other types of fishing to show a red light over white and to require the showing of a stern light. A new provision concerning lights on vessels with outlying gear extending more than 500 feet has been added. A new provision has been added permitting the use of the searchlight beam to warn approaching vessels as well as a flare-up light or working lights as now provided and a new day signal has been provided for vessels engaged in fishing.

Rule 13. The discretionary powers authorized under the existing rule in respect to rules made by governments have been amplified to include "fishing vessels engaged in fishing as a fleet." The provision for "recognition signals adopted by shipowners, which have been authorized by the respective governments" has been deleted.

COMMERCIAL FISHERIES FUND: H. R. 5798 (O'Neill) introduced in House Apr. 23, 1963, to promote State commercial fishery research and development projects, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

The Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Apr. 25, 1963, recessed the hearings, subject to call, on S. 627, to promote State commercial fishery research and development projects, and for other purposes.

On May 14, 1963, Senator Bartlett (Alaska) presented a statement to the Senate (Congressional Record, May 14, 1963, pages 7990-7992) concerning the problem of Soviet fishing activities off the coasts of the United States from the most northern waters of Alaska, the east coast from Maine to Florida, and to the Gulf of Mexico. He also stated that the Soviet fishing fleet has vessels far superior to those of the U.S. fishing fleet and that the U.S. has no fishing vessels of the size of the smallest Russian vessels. He further states, that the U.S. has dropped down to fifth position in world fisheries due to the lack of technical and financial assistance to the fishermen and unless aid to the fishing industry is given we may drop down the list even further. The presence of Soviet fishing vessels off the coasts of the United States not only cause a threat to the fishing industry but to the national security.

Senator Gruening (Alaska) concurred with Senator Bartlett and further stated support for the Senator's bill, S. 627, to promote State commercial fishery research and development projects, and for other purposes.

COMMODITY PACKAGING AND LABELING: The Antitrust and Monopoly Subcommittee of the Senate Committee on the Judiciary on Apr. 24, 1963, resumed hearings on S. 387, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes. Bill directs the Food and Drug Administration--for foods, drugs, and cosmetics--and the Federal Trade Commission--for other consumer commodities--to promulgate regulations that will require packages accurately and clearly to give essential product information and fairly represent the contents.

The Antitrust and Monopoly Subcommittees of the Senate Committee on the Judiciary on April 26, 1963, concluded its series of hearings on S. 387.

H. R. 6220 (Rosenthal) introduced in House May 9, 1963, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; referred to Committee on the Judiciary.

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The House on May 6, 1963, and the Senate on May 8, 1963, were presented with a concurrent resolution from the South Carolina Legislature urging the Congress of the United States to act favorably upon legislation now before the body, exempting certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers. Congress was urged to give favorable consideration to H. R. 4700 and S. 1061. Referred to the Senate Committee on Commerce and the House Committee on Interstate and Foreign Commerce.

The Surface Transportation Subcommittee of the Senate Committee on Commerce May 15, 1963, recessed, subject to call, hearings held on S. 1061, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products and passengers, and for other purposes.

The Surface Transportation Subcommittee held an executive session, May 16, 1963, and announced that it had agreed to hold further hearings on S. 1061.

FISH PROTEIN CONCENTRATE: On May 8, 1963, Representative Keith (Mass.), and Senator Saltonstall (Mass.) were given permission by their respective houses to have printed in the Congressional Record, an article from the Wall Street Journal, which is an excellent explanation of the problem involving the production of fish protein concentrate in the United States. The articles appear on pages 7628-7629 and A-2862-A2863 of the May 8, 1963, issue of the Congressional Record.

FOOD-FOR-PEACE, AND FISH: The Senate on April 26, 1963, was presented with a joint resolution of the Legislature of the State of Maine memorializing Congress to consider promptly and favorably S. 702 and H. R. 3965, relating to domestically-produced fishery products, which would authorize the procurement and distribution of domestically-produced fishery products under the food-for-peace program. Resolution further states that the Federal Government has embarked on a program for food for peace to facilitate the purchases of domestic food surplus for sale to needy foreign nations; the use of healthful, high in protein fishery products would contribute to the success of the program; the development and progress of the fishery resources of the United States requires expanded domestic and foreign markets; the offshore fishery resources of the United States are being harvested by foreign powers unconcerned with proper conservation measures and the domestic market flooded with low-cost produced imports; and the fishing industry is one of our Nation's greatest present potential sources of foodstuffs.

The House on Apr. 29, 1963, was presented with a memorial of the Legislature of the State of Maine recommending that Congress give prompt and favorable consideration to S. 702 and H. R. 3965, bills which would make domestically-produced fishery products eligible for procurement and distribution under the food-for-peace program to assist that program and the development of the domestic fishery resources; referred to the Committee on Agriculture.

Senator Bartlett of Alaska (Congressional Record, Apr. 30, 1963, pp. 6921-6924) presented the Senate with a statement on the need for fish products in the food-for-peace program. In his statement Senator Bartlett pointed out that a substantial improvement is required to save the fishing industry, the fishermen, and the fishery resources from extinction. An unstable market and enormous foreign imports made possible by heavily subsidized or state-owned foreign fleets face the United States fishing industry, along with widely fluctuating prices, competition from modern, well-equipped, technically advanced vessels, and exploitation of our off-shore fishery resources by foreign vessels. The 88th Congress has introduced a number of legislative proposals that would help to turn the tide by promoting fishery research and development, by encouraging our fishing fleets to modernize and by expanding foreign markets for domestic fishery products.

He stated his support for one of the legislative proposals, S. 702, relating to domestically-produced fishery products, "... the bill would permit domestically-produced fishery products to be used in the food-for-peace program when the Director of the program determines that the utilization of a specific fishery product would contribute to the food-for-peace program and the Secretary of the Interior determines that the inclusion would contribute to the development of the fishery resources or assist a segment of the fishing industry." The legislation would assist the fishing industry in three ways which are: (1) friendly nations would be permitted to buy American fishery products and pay for them in their own local currency, the supplier would receive the dollar equivalent from the Commodity Credit Corporation; (2) long-term loans could be made available to importers in friendly countries interested in buying American fish products, and the CCC would be permitted to hold notes from the foreign countries and make payment for exports in dollars to American exporters; and (3) would permit domestic fishery products to be included in the food-for-peace program that is administered through some 17 American voluntary relief agencies, to the undernourished in friendly foreign nations.

H. R. 6361 (King) introduced in House May 15, 1963, relating to domestically-produced fishery products; referred to the Committee on Agriculture.

GREAT LAKES FISHERY: Senator Hart of Michigan (Congressional Record, Apr. 24, 1963, pp. 6658-6663) presented to the Senate on Apr. 24, 1963, a program for the Great Lakes Fisheries. In his statement, Sen. Hart discussed the history of the fisheries of the Great Lakes, their growth, economic effect in that area, and their many problems. He further stated that, "Throughout the Great Lakes, fishermen need sound advice and practical demonstrations of the proper handling and refrigeration of the catch. Too frequently, poor quality is assured even before the fish are landed. Quality control must be stressed from the time of catch to the consumer's table. Broadening of voluntary Federal inspec-

tion of processing and packing plants should be encouraged. The development of new, more efficient, cheaper methods of taking fish are badly needed. When new methods and gears are developed, the fishermen must have sound advice in their use and on necessary modifications of vessels. Many will need assistance in obtaining capital for a change in method of fishing. Exploratory fishing by Federal vessels, especially with new fishing gears, can provide fishermen with needed information on the grounds and seasonal availability. Elementary but thorough cost studies are needed urgently for various fisheries and species from the time of catching to final purchase by the consumer." Sen. Hart also presented several charts on the production of fish in the Great Lakes which are printed in the Record.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS FY 1964: H. R. 5888 (Fogarty) introduced in House Apr. 25, 1963, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1964, and for other purposes. The bill was reported favorably (H. Rept. 246), to the House by the Committee on Appropriations on the same day.

H. Rept. 246, Department of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1964 (Apr. 25, 1963, a report from the Committee on Appropriations, House of Representatives, 88th Congress, 1st Session), to accompany H. R. 5888) 64 pp., printed. The Committee after due consideration, recommended passage of the bill.

The House on Apr. 30, 1963, passed by voice vote H. R. 5888. Included are funds for Food and Drug Administration, milk, food, interstate and community sanitation and water pollution control. The milk, food, interstate and community sanitation program assures that only safe water, milk, shellfish and other marine food, and food supplies are served to public, will provide for research and technological assistance programs on shellfish and other marine foods at the two new shellfish sanitation research centers which are to be constructed. The water pollution program provides for regional laboratories located in strategic points throughout the country to promote research and training activities and provide a base of action of State, interstate, and Federal agencies cooperating to eliminate water pollution. Received in the Senate on May 1, 1963; referred to the Committee on Appropriations.

IMPORT COMMODITY LABELING: Marking of Imported Articles (Hearing before the Committee on Finance, United States Senate, 88th Congress, 1st Session). Contains hearings held Mar. 21, 1963, on H. R. 2513, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes; testimony of witnesses from Government agencies and industry; and written communications.

H. R. 6217 (Clausen) introduced in the House May 9, 1963, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes; referred to the Committee on Ways and Means.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1964: Department of the Interior and Related Agencies Appropriations for 1964 (Hearings before a Subcommittee of the Committee on Appropriations, House of Rep-

representatives, 88th Congress, 1st Session), 1,830 pp., printed. Included in the testimony is funds for the Fish and Wildlife Service: the Office of the Commissioner, and its two bureaus, Commercial Fisheries and Sport Fisheries and Wildlife.

The Subcommittee of the Senate Committee on Appropriations, in executive session, on May 15, 1963, marked up and approved for full committee consideration H. R. 5279, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1964, and for other purposes. The full Committee met in executive session to consider this bill on May 22, 1963.

INTERNATIONAL FISHING LIMITS: Senator Bartlett (Alaska) on May 15, 1963, presented a statement to the Senate (Congressional Record, May 15, 1963, pages 8163-8164) on the need for the extension of international fishing limits, to protect the fishing grounds for countries all over the world. He also asked to have included in the Record copies of letters between the Secretary of State and himself concerning this subject.

Senator Bartlett was granted permission to have printed in the Appendix of the Congressional Record, May 15, 1963, pages A3035-A3036, the speech given by Mr. Edward W. Allen at the Northwest Pacific Regional Conference on International Law, titled, "Turmoil in the North Pacific." Mr. Allen's speech dealt with subjects including the International Law of the Sea, the problems confronting the halibut fishery, and the need for conservation.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION: Senator Magnuson, on May 13, 1963 (Congressional Record, May 13, 1963, pages 7808-7809), presented to the Senate a statement concerning the designation by President Kennedy of Benjamin Smith (former Senator from Massachusetts) as chairman of the United States delegation at the Conference of the International North Pacific Fisheries Commission to be held during the month of June in Washington, D. C. Senator Magnuson further states that the pattern that could be set up at this meeting, could in turn, affect high sea fisheries in other parts of the world as the need mounts for more and more conservation of food fish.

MEDICAL CARE FOR VESSEL PERSONNEL: On Apr. 25, 1963, the Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce, recessed the hearings, subject to call, on S. 978, to provide medical care for certain persons engaged onboard a vessel in the care, preservation, or navigation of such vessel.

The Senate Committee on Commerce May 14, 1963, in executive session, ordered favorably reported S. 978.

METRIC SYSTEM STUDY: H. Con. Res. 145 (Fulton) introduced in House Apr. 29, 1963, expressing the sense of the Congress with respect to the adoption in the United States of the metric system of weights and measures; referred to the Committee on Science and Astronautics.

OUTDOOR RECREATION BUREAU: On Apr. 29, 1963, the House by voice passed H. R. 1762, to promote the coordination and development of the effective Federal and State programs relating to outdoor recreation. The passage of H. R. 1762, was subsequently vacated and S. 20, a similar bill, was passed in lieu after having been amended to contain the House-passed text.

The Senate on May 1, 1963, disagreed to the House amendments to S. 20, to promote the coordination and development of the effective Federal and State programs relating to outdoor recreation, and for other purposes, and asked for a conference with the House. Appointed as conferees were Senators Jackson, Anderson, Bible, Kuchel, and Allott.

The House on May 13, 1963, insisted on its amendments to S. 20; agreed to a conference requested by the Senate; and appointed as conferees Representatives Aspinall, O'Brien (New York), Morris, Saylor and Chenoweth.

On May 15, 1963, the House received from the Committee of Conference its report (H. Rept. 303) on S. 20. The House and the Senate on May 16, 1963, adopted the conference report (H. Rept. 303) on S. 20, to promote the coordination and development of effective Federal and State programs relating to outdoor recreation and for other purposes; thus clearing the bill for the President's signature.

PACIFIC ISLANDS TRUST TERRITORY DEVELOPMENT: On Apr. 30, 1963, the Subcommittee on Territorial and Insular Affairs of the House Committee on Interior and Insular Affairs held a hearing in executive session on H. R. 3198, to promote the economic and social development of the Trust Territory of the Pacific Islands, and for other purposes. Hearings adjourned subject to call.

PRICE-QUALITY STABILIZATION: On Apr. 26, 1963, the Subcommittee on Commerce and Finance of the House Committee on Interstate and Foreign Commerce, adjourned, subject to call, hearings on H. R. 3669 and similar bills, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes.

H. R. 5934 (Wyman) introduced in House Apr. 29, 1963, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to the Committee on Interstate and Foreign Commerce.

The Subcommittee on Commerce and Finance of the House Committee on Interstate and Foreign Commerce resumed hearings May 14 and 15, 1963, on H. R. 3669 and related bills.

On May 15, 1963, the Subcommittee on Commerce and Finance of the House Committee on Interstate and Foreign Commerce concluded hearings on H. R. 3669 and related bills.

SOVIET FISHING ACTIVITY IN CARIBBEAN: Representative Fascell (Florida) on May 16, 1963, presented a statement to the House (Congressional Record, May 16, 1963, pages 8290-8292) on the serious problem of Soviet trawlers in the Caribbean. The Congressman states, "... there have been insistent and conflicting rumors and reports as to the purposes for which these vessels are operated; whether the bases from which they operate are also submarine bases; whether the

trawlers themselves are nothing but coverups for either military purposes, espionage. . . ." He also commended Representative Rogers (Florida) for disclosing to the public that Soviet trawlers have penetrated the 3-mile limit of the United States.

Representative Fascell also stated, "Soviet Russia, recognizing the importance of meeting its protein deficiency, has established an intelligent world fishing plan operated by the state. The dedicated interest of the Soviets in fishing has brought them, in a few short years, to the top four nations in world fishing production. . . . Cuba with its many natural harbors close to established stocks of fish figures heavily in the Soviet master plan."

Representative Rogers (Florida) and Mathias (Maryland) concurred with Congressman Fascell and commended him for bringing this serious problem to the attention of the House.

STERN RAMP TRAWLERS: Hearings were recessed, subject to call, on S. 744, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for research, and for other purposes; by the Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce on Apr. 25, 1963.

SUPPLEMENTAL APPROPRIATIONS FY 1963: The Senate Committee on Appropriations, in executive session, on Apr. 24, 1963, ordered favorably reported, with amendments, H. R. 5517, making supplemental appropriations for fiscal year 1963. Included are funds for the Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service. Senate received the report (S. Rept. 155) on Apr. 24, 1963.

S. Rept. 155, Supplemental Appropriation Bill, 1963 (Apr. 24, 1963, a report from the Committee on Appropriations, U.S. Senate, 88th Congress, 1st Session, to accompany H. R. 5517), 49 pp., printed. The Committee recommended an appropriation of \$658,400, the same amount as the House allowance and \$13,600 less than the budget estimate for the Bureau of Commercial Fisheries. Of this amount \$258,400 is to be applied to pay increased costs, and \$400,000 is for the purposes of developing and perfecting techniques for the production of fish protein concentrate.

The Senate on May 1, 1963, passed with amendments H. R. 5517, making supplemental appropriations for fiscal year 1963. The Senate insisted on its amendments and asked for a conference with the House, and appointed as conferees Senators Pastore, Holland, Hayden, Russell, Ellender, Hill, Young (N. Dakota), Saltonstall, and Mundt.

The House on May 2, 1963, disagreed to the Senate amendments to H. R. 5517, making supplemental appropriations for fiscal year 1963, and agreed to a conference requested by the Senate. Appointed as conferees were Representatives Thomas, Kirwan, Cannon, Bow, and Wilson (Indiana).

The Senate and the House held a joint conference, in executive session, May 6, 1963, on H. R. 5517, making supplemental appropriations for fiscal year 1963, and agreed to file a conference report. The House on May 6, 1963, received the conference report (H. Rept. 275) on H. R. 5517.

H. Rept. 275, Supplemental Appropriations Bill, 1963 (May 6, 1963, report from the Committee of Conference,

House of Representatives, 88th Congress, 1st Session, to accompany H. R. 5517), 9 pp., printed. The Committee of Conference having met, agreed and recommended passage to their respective houses.

The House on May 8, 1963, voted to recommit the conference report on H. R. 5517, making supplemental appropriations for fiscal year 1963, with instructions for the House conferees to insist on disagreement to Senate amendment no. 47. This amendment provides funds for World Food Congress and a contribution to the International Peace Corps Secretariat.

On May 9, 1963, a conference was held, in executive session, on H. R. 5517, and the conferees agreed to file a second conference report.

The Committee of Conference on May 13, 1963, reported (H. Rept. No. 290) to the House on H. R. 5517. This is the second conference report to be submitted for approval.

The House on May 14, 1963, adopted the conference report (H. Rept. 290) on H. R. 5517. The Senate on May 15, 1963, adopted the conference report, thus clearing the bill for the President's signature.

On May 17, 1963, the President signed the bill H. R. 5517, making supplemental appropriations for fiscal year 1963 (P. L. 88-25).

TRANSPORTATION ACT OF 1963: The Surface Transportation Subcommittee of the Senate Committee on Commerce May 15, 1963, recessed, subject to call, hearings held on S. 1062, to provide for strengthening and improving the national transportation system and for other purposes.

The Surface Transportation Subcommittee held an executive session, May 16, 1963, and announced that it had agreed to hold further hearings on S. 1062.

VESSEL CONSTRUCTION SUBSIDY AMENDMENT: H. R. 6069 (O'Neill) introduced in House May 6, 1963, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

WATER POLLUTION CONTROL ADMINISTRATION: H. R. 5848 (Giaino) introduced in the House Apr. 24, 1963, to amend the Federal Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes; also introduced H. R. 5911 (Green), Apr. 29, 1963, both referred to the Committee on Public Works.

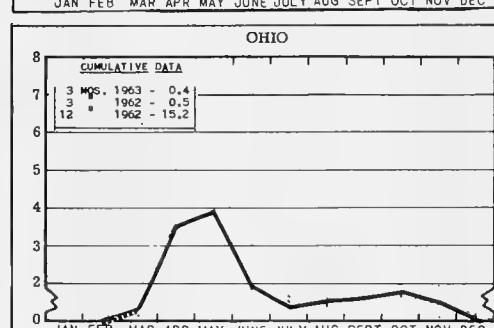
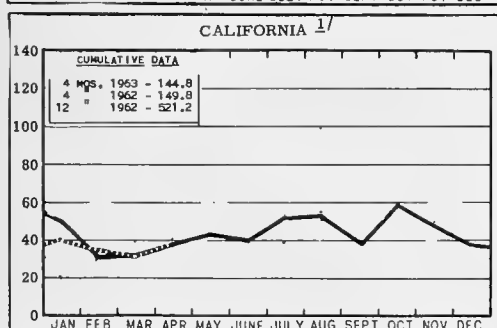
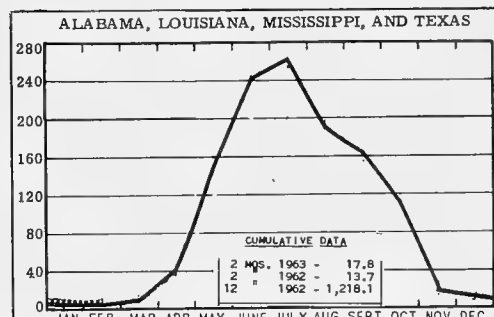
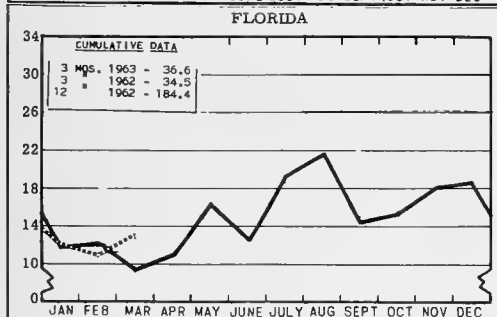
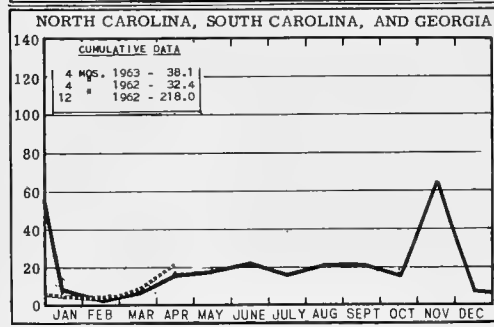
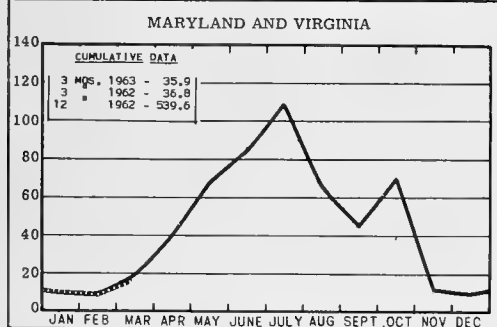
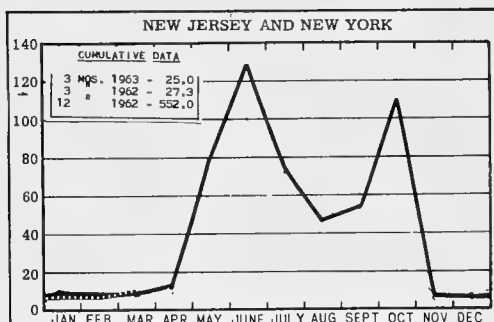
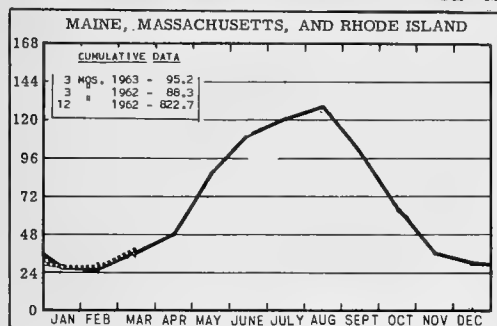
WATER POLLUTION CONTROL AID TO INDUSTRY: H. R. 5851 (Giaino) introduced in House Apr. 24, 1963, to promote water and air pollution control and abatement by authorizing the Secretary of Health, Education, and Welfare to provide certain assistance to small business concerns in obtaining necessary treatment works; referred to the Committee on Public Works.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

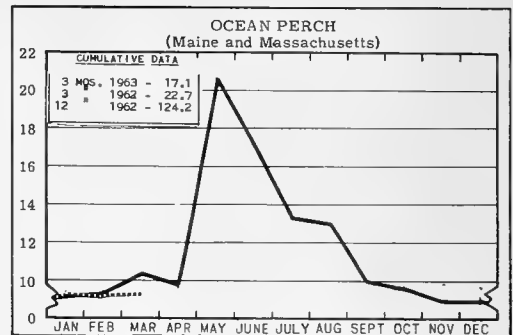
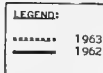
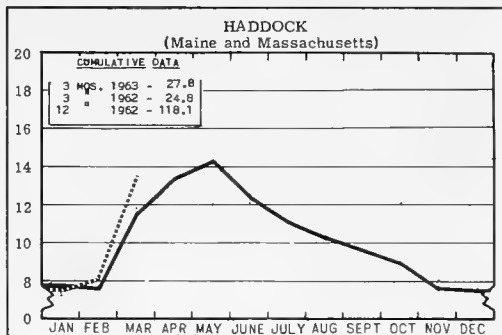
In Millions of Pounds



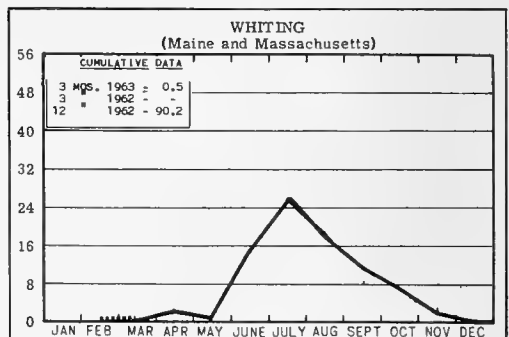
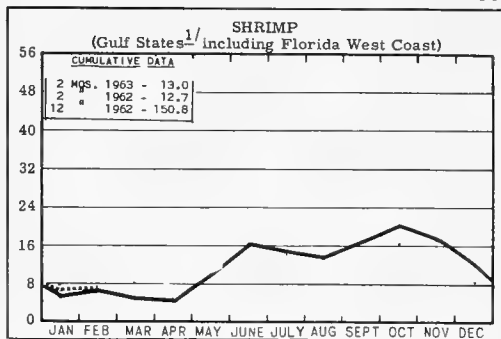
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

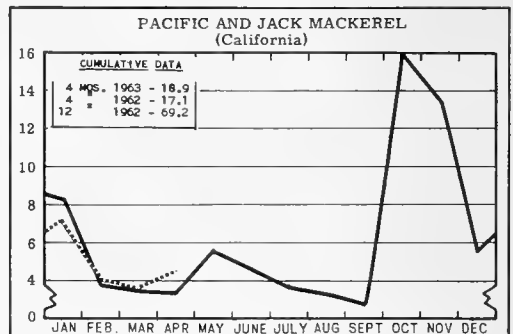
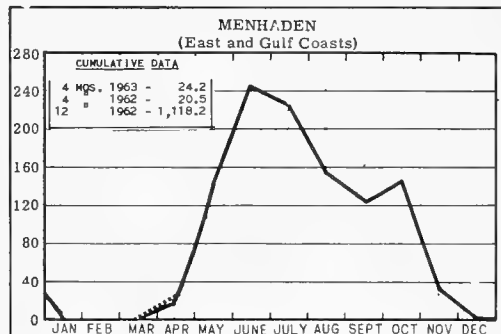


In Millions of Pounds

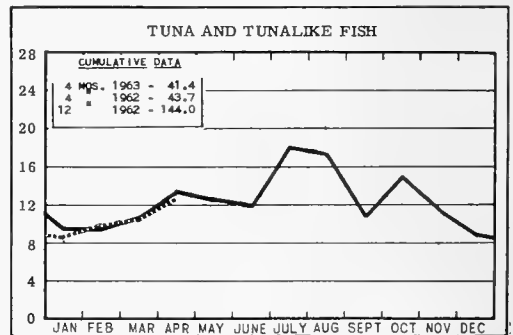
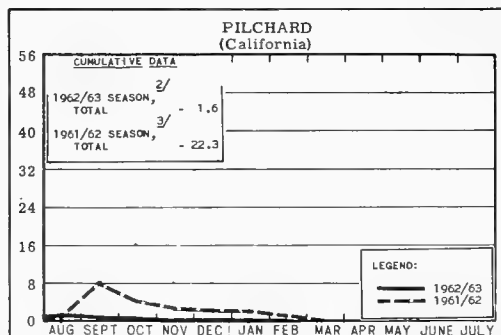


^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons

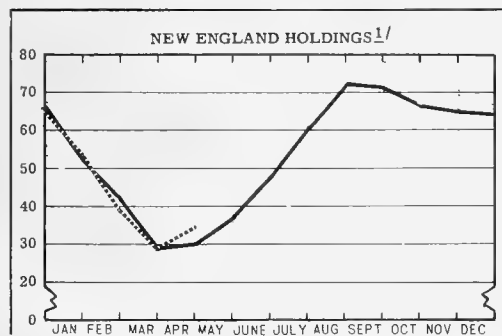
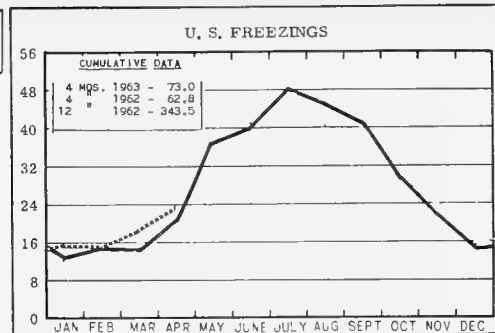
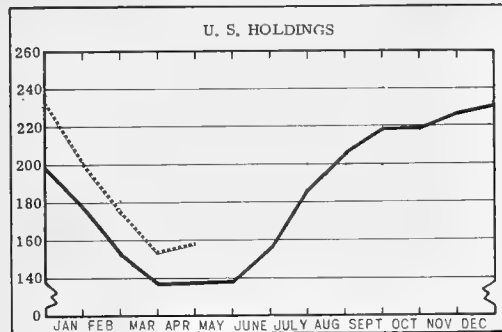


In Thousands of Tons

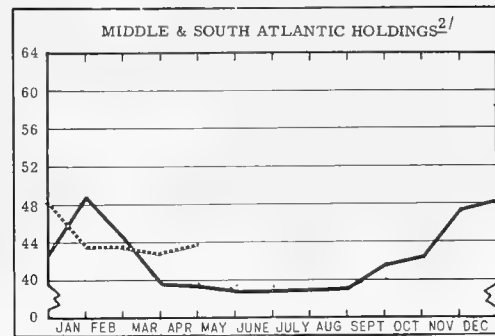


^{2/}SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963. ^{3/}SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

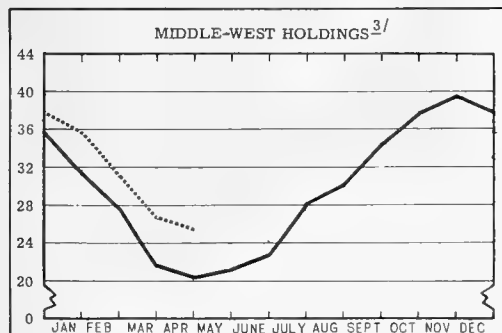
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS * **in Millions of Pounds**



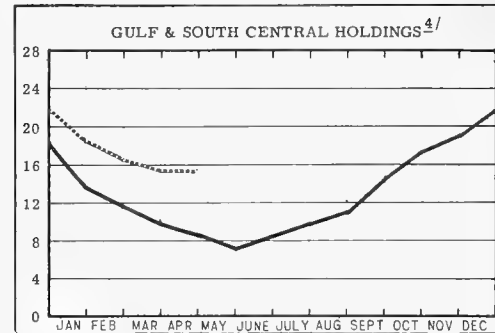
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



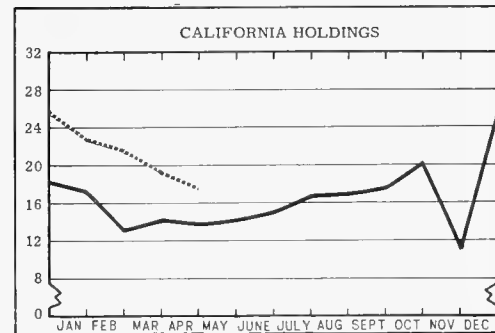
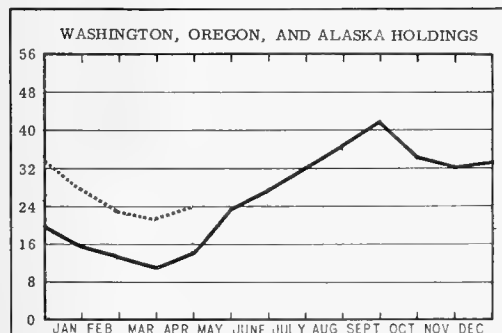
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.



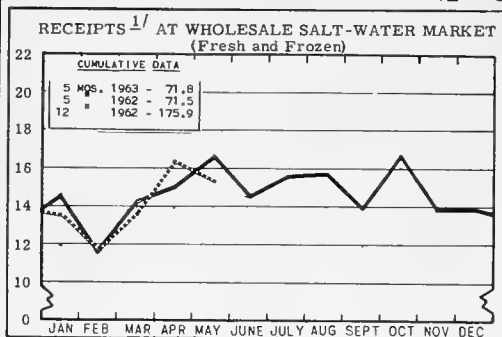
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



* Excludes salted, cured, and smoked products.

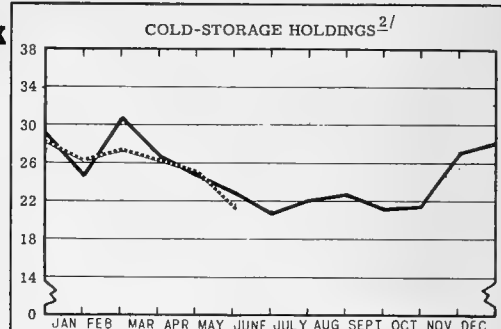
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

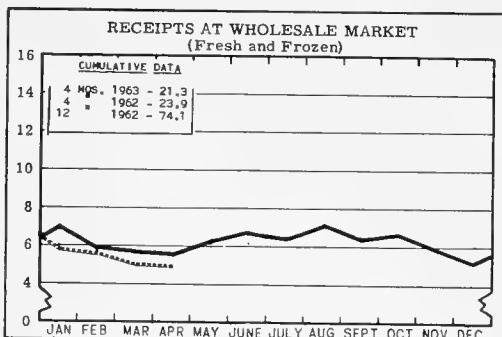


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

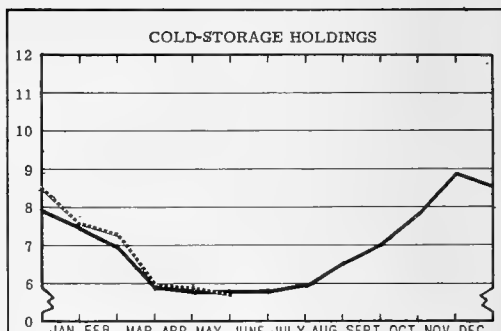
NEW YORK CITY



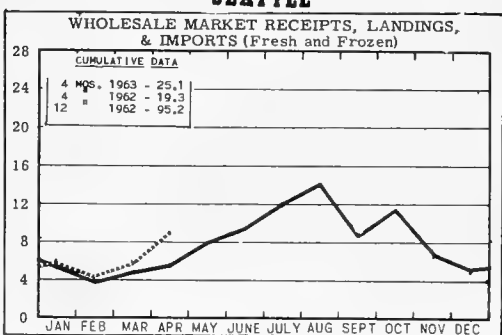
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



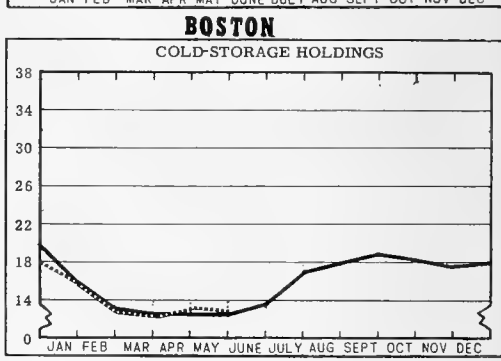
CHICAGO



SEATTLE



LEGEND:
 - - - - - 1963
 ——— 1962



BOSTON

CHART 5 - FISH MEAL and OIL PRODUCTION

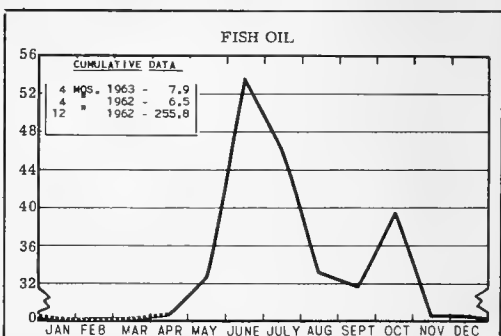
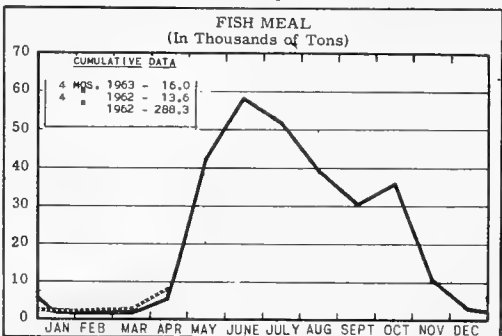
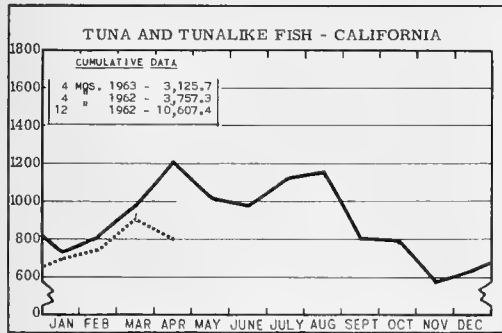
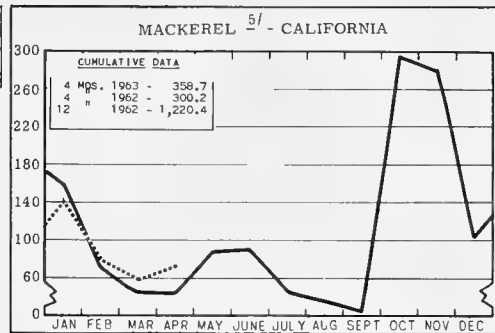


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

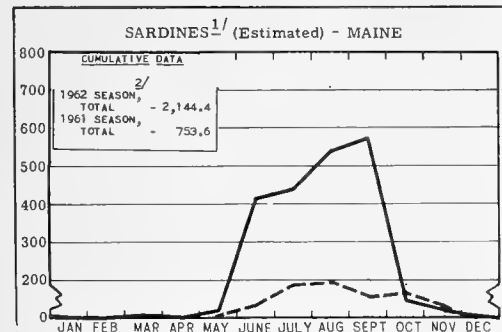
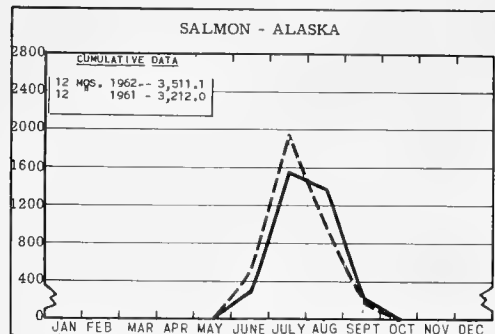
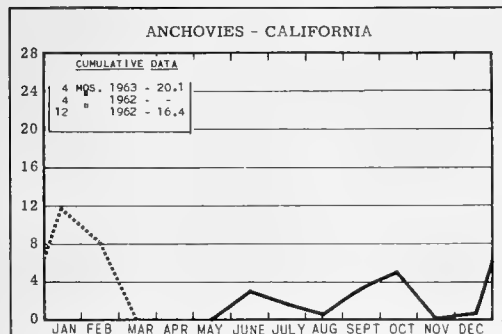
In Thousands of Standard Cases



LEGEND:
..... 1963
—— 1962
--- 1961



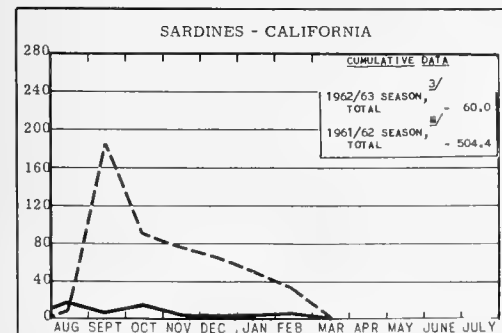
^{5/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



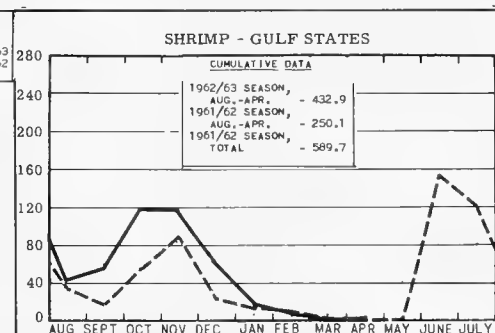
^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	3 $\frac{3}{4}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	$\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.



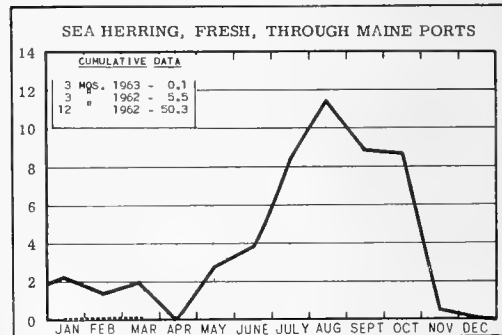
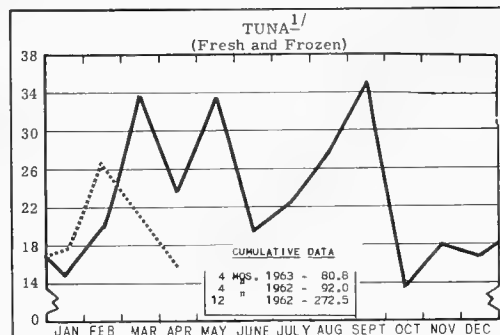
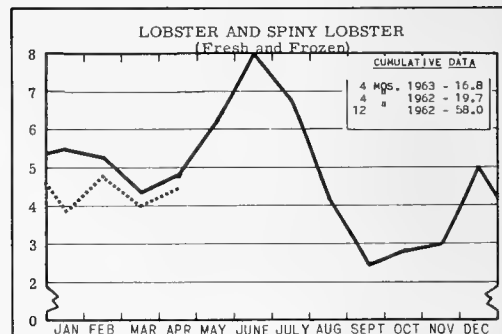
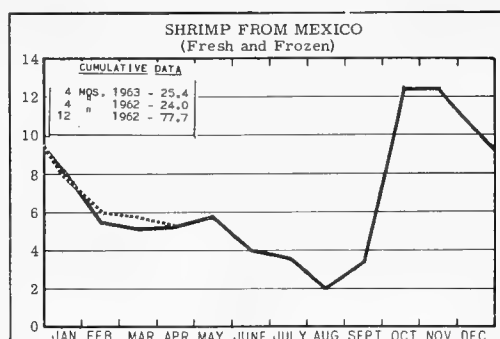
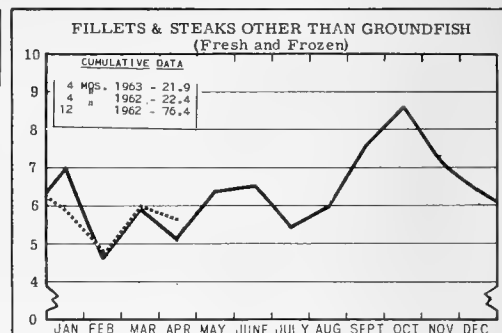
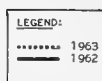
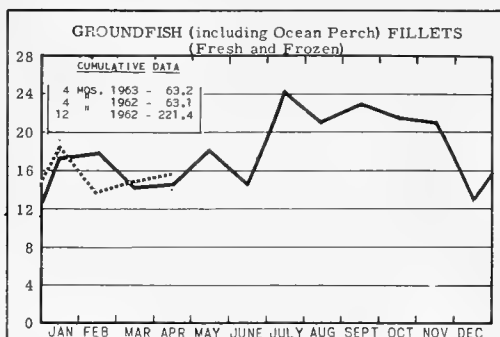
LEGEND:
—— 1962/63
--- 1961/62



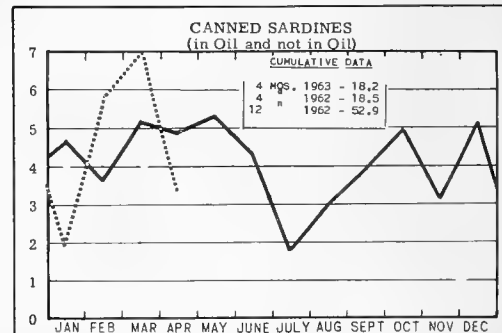
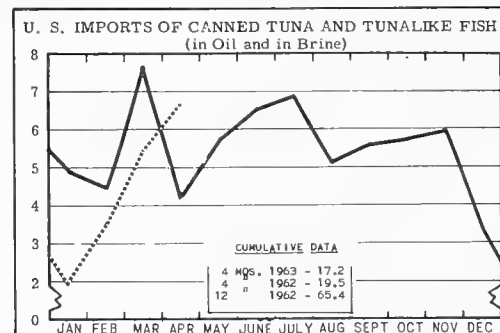
^{3/} SEASON TOTAL, AUG. 1, 1962-FEB. 28, 1963.
^{4/} SEASON TOTAL, AUG. 1, 1961-FEB. 28, 1962.

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

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MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|--|
| CFS-3132 | - North Carolina Landings, January 1963, 4 pp. |
| CFS-3134 | - Fish Meal and Oil, January 1963, 2 pp. |
| CFS-3136 | - New Jersey Landings, January 1963, 4 pp. |
| CFS-3137 | - Virginia Landings, December 1962, 4 pp. |
| CFS-3140 | - Frozen Fishery Products, February 1963, 8 pp. |
| CFS-3141 | - Packaged Fishery Products, 1962 Annual Summary, 5 pp. |
| CFS-3143 | - New York Landings, January 1963, 4 pp. |
| CFS-3144 | - Canned Fishery Products, 1962 Annual Summary, 17 pp. |
| CFS-3145 | - Mississippi Landings, January 1963, 2 pp. |
| CFS-3147 | - Rhode Island Landings, January 1963, 3 pp. |
| CFS-3148 | - Shrimp Landings, August 1962, 8 pp. |
| CFS-3149 | - Louisiana Landings, January 1963, 2 pp. |
| CFS-3151 | - Massachusetts Landings, November 1962, 6 pp. |
| CFS-3152 | - Georgia Landings, February 1963, 3 pp. |
| CFS-3154 | - Virginia Landings, January 1963, 3 pp. |
| CFS-3155 | - South Carolina Landings, February 1963, 3 pp. |
| CFS-3156 | - North Carolina Landings, February 1963, 4 pp. |
| CFS-3157 | - Industrial Fishery Products, 1962 Annual Summary, 9 pp. |
| CFS-3158 | - Florida Landings, February 1963, 8 pp. |
| CFS-3200 | - Fisheries of the United States, 1962 (A Preliminary Review), 78 pp., illus., April 1963. |
- This bulletin includes 1962 statistics on the United States catch; historical fishery data; employment, craft, and plants; per capita consumption; manufactured fishery products; price indexes; value of military purchases of fishery products; population and fish supply; foreign trade; financial assistance programs; supplies of certain fishery products; and world fisheries. The catch in 1962 amounted to 5.2 billion pounds valued at \$381 million to the fishermen. Of the catch, 2.5 billion pounds were used for human food while the remainder was used for bait

and animal food and for the manufacture of industrial products. The per capita consumption of commercially-caught fish and shellfish in 1962 amounted to 10.5 pounds--0.2 pounds less than in the previous year. Included in the bulletin for the first time are estimated data on the consumption of domestic and imported fish and shellfish, and on the per capita consumption of fishery products in most of the important countries in the world. Also included is a tabulation showing years in which fishing vessels were constructed. In addition, there is a new section which lists, alphabetically, 16 species of fish and shellfish and, for each, the types of information presented and the pages on which each appears.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON 5, D. C.

- | Number | Title |
|--------|---|
| MNL-63 | - Egyptian Fisheries, 1961, 8 pp. |
| MNL-77 | - Fisheries Survey of Ghana, 19 pp. |
| MNL-78 | - Fishery Developments in Senegal, 12 pp. |
| MNL-79 | - Fisheries Survey of Nigeria, 12 pp. |

Sep. No. 675 - Comparison of Salmon Catches in Monofilament and Multifilament Gill Nets.

Sep. No. 676 - Present and Future Market for Fish Oil.

Firms Canning, 1962 (Revised):

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| SL-101 | - Salmon, 3 pp. |
| SL-102 | - Maine Sardines, 1 p. |
| SL-102A | - Pacific Sardines, 1 p. |
| SL-103 | - Tuna, 2 pp. |
| SL-103A | - Tunalike Fishes, 1 p. |
| SL-104 | - Mackerel, 1 p. |
| SL-105 | - Alewives, 1 p. |
| SL-106 | - Shad, 1 p. |
| SL-107 | - Fish and Shellfish Specialities, 5 pp. |
| SL-109 | - Caviar and Fish Roe, 2 pp. |
| SL-110 | - Oysters, 2 pp. |
| SL-111 | - Clam Products, 2 pp. |

SSR-Fish, No. 401 - Survey of the Benthic Invertebrate Fauna of the Eastern Bering Sea, by Patsy A. McLaughlin, 77 pp., illus., 1963.

SSR-Fish, No. 430 - The Length, Age, and Sex Ratio of Chum Salmon in the Alaska Peninsula, Kodiak Island, and Prince William Sound Areas of Alaska, by Fredrik V. Thorsteinson, Wallace H. Noerenberg, and Howard D. Smith, 88 pp., illus., 1963.

SSR-Fish. No. 434 - Distribution of Fishing by Purse-Seine Vessels for Atlantic Menhaden, 1955-1959, by Charles M. Roithmayr, 26 pp., illus., 1963.

SSR-Fish. No. 438 - Length and Age Frequency Samples Collected from Georges Bank Haddock Landings, 1931-1955, by James A. McCann and Frank A. Dreyer, 131 pp., illus., 1963.

SSR-Fish. No. 439 - Length and Age Frequency Samples Collected from Georges Bank and Gulf of Maine Haddock Landings, 1956-1960, by James A. McCann and Frank A. Dreyer, 116 pp., illus., 1963.

Safety Manual for Fishermen, Captains, and Owners of New England Fishing Vessels, by John J. Murray, Circular 150, 68 pp., illus., printed, July 1962. This manual was prepared in accordance with the safety philosophies and safety practices of American industry. Deals with fundamentals and presents, in condensed form, safety suggestions and practices which, it is hoped, will soon become common knowledge. Among the subjects covered are deck and engineroom safety, lifesaving equipment, fire, weather worries, and first aid at sea. With all the policies, manuals, and rules, the best safety device is still "a careful man," according to the author.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, February 1963, 8 pp. (Market News Service, U.S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fisheries, 1962, by V. J. Samson, 52 pp., illus., March 1963. (Market News Service, U.S. Fish and Wildlife Service, Room 208, Post Office Bldg., San Pedro, Calif.) A review of 1962 trends and conditions in the California fisheries, including a historical review of California fish-meal prices, 1941-1962. Among the subjects discussed are the tuna industry and cannery receipts; domestic tuna fishery; decline in yellowfin catch; albacore fishery; ex-vessel tuna prices; canned tuna pack; imports; and status of California purse-seine fleets and the clipper-bait boat fleet in 1962. Also covered are the sardine industry and canned pack; mackerel fishery pack, and prices; anchovy fishery; canned pet-food pack; whaling industry; and seasons in major fisheries. Included in the statistical tables are data on tuna and tunalike fish--canners' receipts, domestic landings, frozen imported tuna, and canned pack, 1960-1962; sardine landings, pack, and meal and oil produced, 1961-1962 and 1962-1963 seasons; and the cannery receipts and pack of mackerel and jack mackerel, 1960-1962. Contains data on cannery receipts of raw materials and production of anchovies, herring, squid, pet food, and meal and oil; landings of fish and shellfish in the Eureka and San Pedro-Santa Monica areas; imports of fishery products into Arizona and California Customs Districts, 1961-1962; and California whale fishery, 1960-1962.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market

Data, February 1963, 14 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., Room 208, San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, March 1963, 16 pp., illus. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, P.O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, March 1963, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Annual Summary, 1962, by John J. O'Brien, 46 pp., illus., April 1963. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the fish marketing trends and conditions at the principal New England fishery ports, and highlights of fisheries in nearby areas. The development of a large-scale purse-seine tuna fishery in New England made considerable progress in 1962. The summary covers food-fish landings by ports and species; industrial fish landings and ex-vessel prices; fishing vessel news; imports; frozen fishery products; the fish-meal market; swordfish long-lining; Soviet vessels on Georges Bank; and other information. Also includes fishery landings and ex-vessel prices by months for ports of Boston, Gloucester, New Bedford, Provincetown, Portland, Rockland, Point Judith, and Stonington; highlights of the Maine sardine and lobster fisheries; events in the fisheries of Canada, Denmark, Iceland, Norway, Japan, and Peru; and historical data of fisheries at principal New England ports. In addition, contains data on monthly landings and ex-vessel prices, by species at Boston and Atlantic Ave. fish piers.

New England Fisheries--Monthly Summary, March 1963, 23 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston

Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

Refrigeration (Table of Contents), by Junkichi Nagaoka and Kazuo Tanaka, 9 pp., processed. (Translated from the Japanese Suisangaku Zenshu, vol. 7, 458 pp.) (U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, 101 Seaside Ave., Terminal Island, Calif.)

Seattle--Landings, Receipts, and Value of Fishery Products, 1962, by Charles M. Reardon, 34 pp., April 1963. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Reviews Pacific Northwest fisheries trends and their effect upon Seattle fishery receipts for 1962. Contains statistical tables on landings by U.S. halibut fleet; carload and truckload shipments of fishery products from Seattle by months; imports of canned fishery products; receipts of Alaska canned fish and shellfish; and names, classifications, and approximate standards as used on Seattle wholesale market. Also presents data on receipts of fresh and frozen fish and shellfish, fresh and frozen salmon receipts and imports, receipts of fresh and frozen king crab, Pacific oysters, and shrimp at Seattle, ex-vessel landings by the otter-trawl fleet, Puget Sound canned salmon pack, and related information.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, March 1963, 6 pp. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; imports from other countries through Washington customs district; and Washington heads-on shrimp landings; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

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ALGAE:

**The Food Value of Diatomaceous Algae, by G. K. Barashkov, Trans. A-1375, 3 pp., processed. (Translated from the Russian, Priroda, no. 6, 1960, p. 100.)

"The Species of Gracilaria and Gracilariopsis from Japan and Adjacent Waters," by Hikoei Ohmi, article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 6, no. 1, 1958, 66 pp., illus., printed in Japanese. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

ARGENTINA:

Peces Argentinos de Agua Dulce. Claves de Reconocimiento y Caracterización de Familias y Sub-Familias, con Glosario Explicativo (Argentina's Fresh-Water Fish. Keys to the Identification and Description of Families and Sub-Families with Explicit Glossary), by Raul A. Ringuelet and Raul H. Aramburu, Agro Publicacion Tecnica, vol. 3, no. 7, March 1961, 102 pp., illus., printed in Spanish. Ministerio de Asuntos Agrarios, Buenos Aires, Argentina.

Peces Marinos de la Republica Argentina. Clave para el Reconocimiento de Familias y Generos (Marine Fish of the Republic of Argentina. Key to the Identification of Families and Genera), by Raul A. Ringuelet and Raul H. Aramburu, Agro Publicacion Tecnica, vol. 2, no. 5, November 1960, 143 pp., illus., printed in Spanish. Ministerio de Asuntos Agrarios, Buenos Aires, Argentina.

Produccion Pesquera de la Republica Argentina Ano 1961 (Fishery Production in the Republic of Argentina, 1961), 113 pp., illus., processed in Spanish. Departamento de Investigaciones Pesqueras, Direccion General de Pesca, Secretaria de Estado de Agricultura y Ganaderia, Buenos Aires, Argentina.

CANADA:

"Canadian Fisheries in 1962," article, Trade News, vol. 15, no. 8, February 1963, pp. 9-12, 15, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Discusses the Atlantic fisheries, and the industry in the Maritime Provinces, Newfoundland, British Columbia, and the inland provinces. "Canadian fisheries were more prosperous in 1962 than at any previous time in their history. Top records of previous years were surpassed in every major sector with expansion spilling over to add impetus to the construction and boat-building industries also," according to the author.

Journal of the Fisheries Research Board of Canada, vol. 20, no. 1, January 1963, 254 pp., illus., printed, single copy C\$1.50. Queen's Printer and Controller Stationery, Ottawa, Canada. Includes, among others, these articles: "The Nature of an Unusual Amino Acid-Pyrimidine Complex from the Cod Parasite, Porrocaecum decipiens," by H. C. Freeman, P. L. Hoogland, and P. H. Odense; "Sampling the Catch of a Research Vessel," by J. E. Paloheimo and L. M. Dickie; "Estimation of Catchabilities and Population Sizes of Lobsters," by J. E. Paloheimo; "The Air Blowing of Cod Liver Oil. II--Changes in Fatty Acid Composition as Determined by Gas-Liquid Chromatography," by P. M. Jangaard and others; "Resumption of Feeding by and Survival of Adult Sockeye Salmon (Oncorhynchus nerka); Following Advanced Gonad Development," by J. R. McBride and others; "Oceanography of the Subarctic Pacific Ocean," by

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Michitaka Uda; and "An Estimation of the Mortality Rates in a Population of *Tilapia esculenta* Graham (Pisces, Cichlidae) in Lake Victoria, East Africa," by D. J. Garrod.

List of Publications. The Department of Fisheries of Canada, no. 1, October 1962, 21 pp., printed. Information and Consumer Service, Department of Fisheries of Canada, Ottawa, Canada. The publications listed include contributions by the various Services of the Federal Department of Fisheries, Dominion Bureau of Statistics, Fisheries Research Board of Canada and National Research Council. They include both sale and free copies and are of many types--periodicals, booklets, reprints of published articles, cookery bulletins, statistical reports, research circulars, and others.

CANNED FISH:

Report on the Market for Canned Fish, by G. M. Gerhardsen, E. P. A. Project No. 8/12-A, 334 pp., processed, limited distribution. Technical Actions Division, Agricultural Directorate, Organisation for Economic Co-Operation and Development, 2 Rue Andre Pascal, Paris, France, February 1963. (Also available (limited distribution) from Organisation for Economic Co-Operation and Development, 1346 Connecticut Ave. NW., Washington, D. C.) The final report of a survey based on information supplied by O. E. C. D. member countries in reply to a questionnaire, supplemented by data collected by the author. Canned fish constitutes not only a specially appreciated addition to modern food supplies but a permanent additional outlet for the fishermen, whose standard of living depends to some extent on the expansion of the fish-canning industry; states the foreword. After a brief account of the findings of the survey and a presentation of recommendations, the report discusses fishery products markets in Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Turkey, United Kingdom, United States, and Yugoslavia. Also presents statistics on markets in Austria and Switzerland.

CARP:

Report of the State Development Committee on the Introduction of European Carp into Victorian Waters, 24 pp., illus., printed. Fisheries and Wildlife Department, 605 Flinders St. Extension Melbourne C3, Australia, 1962. Presents research results and recommendations on eradication of the European carp in inland waters of the State of Victoria, Australia. European carp and its domesticated forms adversely affect the welfare of other species of fresh-water fish by competing directly with young fish of other species for food; competing with other species for space; and destroying aquatic vegetation. According to the report, it was recommended that enabling legislation be passed to destroy all carp now present in Victorian waters and prevent their further introduction.

COD:

Biological Characteristics of the Separate Groups of the Barents Sea Cod, by E. M. Mankevich, 14 pp., processed. (Translated from the Russian *Sovetskii Rybokhoziaistvennyye Issledovaniia v Severo-Zapadnoi Chasti Atlanticheskogo Okeana*, pp. 253-266, 1960.) Ministry of Agriculture, Fisheries and Food,

Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

"Success to the Fisheries," article, Production Road, vol. 24, no. 4, 1962, pp. 3-4, illus., printed. Twin Disc Clutch Company, Racine, Wis. Discusses the history, food value, and economic significance of the cod in the New England fishery. The importance of the cod to the early history of this area was demonstrated by its being placed on the colonial seal of Massachusetts, and on the Nova Scotian banknote with the legend "Success to the Fisheries."

COMMON MARKET:

"Le Tarif Extérieur Commun Inquiete les Milieux Canadiens de la Pêche" (Common External Tariffs of Concern to Canadian Fishing Circles), article, La Pêche Maritime, vol. 42, no. 1019, February 1963, p. 112, printed in French, single copy 11 NF (about US\$2.25). Les Editions Maritimes, 190 Boulevard Haussmann, Paris 8, France.

CONNECTICUT:

A Fishery Survey of the Lakes and Ponds of Connecticut, Report no. 1, 395 pp., illus., printed. State Board of Fisheries and Game, Lake and Pond Survey Unit, Hartford, Conn., 1959.

CRABS:

Composition of the Diet of Far-Eastern Crabs of Commercial Quality During the Summer, by M. S. Kun and L. V. Mikulich, 12 pp., processed. (Translated from the Russian *Izvestia - Tinro*, vol. 41, 1954, pp. 319-332.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

The Feeding Habits of the Kamchatka Crab in the Spring-Summer Period on the Coasts of Kamchatka and Sakhalin, by V. A. Kulichkova, 21 pp., processed. (Translated from the Russian *Bull. Tinro*, vol. 43, 1955, pp. 21-43.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

CRUSTACEA:

Crustacea, Anomura, by V. V. Makarov, OTS 60-21822, 286 pp., illus., printed, \$3. (Translated from the Russian, *Fauna SSSR, Rakobraznye*, vol. X, no. 3, 1938, Izdatel'stvo Akademii Nauk SSSR, Moscow, U.S.S.R.) Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C., 1962.

"The Specific Features of the Copepod Populations in the Tropical Portion of Pacific Ocean from the Viewpoint of Age Composition," by A. K. Heinrich, article, Okeanologia, vol. 3, no. 1, January 1963, pp. 88-99, printed in Russian. Akademiia Nauk SSSR, Moscow, U.S.S.R.

CZECHOSLOVAKIA:

Prace Laboratoria Rybarstva (Studies Done in the Fisheries Laboratory at Bratislava, Czechoslovakia), 231 pp., illus., printed in Slovak with Russian and English summaries. Vydavatel'stvo Slovenskej Akademie Vied, Bratislava, Czechoslovakia, 1962. Includes, among others, these articles: "Seven Years Activity of Laboratory of Fishery Research in Bratislava," by Frantisek Havlena; "Age and Growth of the Chub (*Leuciscus cephalus* (L.)) in Orava River

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(1944-1952), and in Orava Riverine Lake in the Years Following Its Filling (1953-1958)," by Eugeniusz K. Balon; "Age and Growth of the Chub (Leuciscus cephalus (L.) in the Vah River and Her Branches Near Piestany," by Anton Kirka; "Age and Growth of Salmo trutta m. fario, Salmo gairdneri irideus, Salvelinus fontinalis, and Thymallus thymallus in the brook of Vrica Near Klaster pod Znievom," by Anton Kirka; and "The Haul Seine Fishing on Danube River Near Palkovicovo," by Julius Bel.

DELAWARE RIVER:

Fishes and Ecological Conditions in the Shore Zone of the Delaware River Estuary, with Notes on Other Species Collected in Deeper Water, by Donald P. de Sylva, Frederick A. Kalber, Jr., and Carl N. Shuster, Jr., Information Series, Publication No. 5, 167 pp., illus., processed, University of Delaware Marine Laboratories, Newark, Del., April 1962.

DENMARK:

"Danmarks Produktion af Konserverede Levnedsmidler i 1960" (The Production of Canned Food Products in Denmark in 1960), by Poul Fr. Jensen, article, Konserves & Dybfrost, vol. 20, no. 11, 1962, pp. 138-140, 141, printed in Danish. Konserves & Dybfrost, Vester Farimagsgade, 31, Copenhagen V, Denmark.

FISH BEHAVIOR:

"Fish Behaviour. I--The Migrations of Fish," by A. D. Woodhead, article, World Fishing, vol. 12, no. 3, March 1963, pp. 37-39, illus., printed, single copy 3s. (about 42 U.S. cents), John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

FISH CULTURE:

Increased Harvest of Warm Water Fish Through Supplemental Feeding, by Ralph William Altman, 128 pp., illus., processed. (Submitted to the Faculty of the Graduate School of the Oklahoma State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy, May, 1959.) Oklahoma State University, Stillwater, Okla.

FISH POPULATIONS:

Certain of the Laws Governing the Effect of Fishing Operations on the Structure of Populations and the Individual Characteristics of Fish Belonging to Commercially Exploited Stocks, by G. V. Nikolskii, 21 pp., processed. (Translated from the Russian Trudy Soveshchaniy, Ikht. Kom., no. 13, pp. 21-33, 1961.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

The Laws Governing the Dynamics of Fish Populations, by T. F. Dementieva and others, 19 pp., processed. (Translated from the Russian Trudy Soveshchaniy, Ikht. Kom., no. 13, pp. 7-20, 1961. Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

FISHERY REGULATION:

Economic Effects of Fishery Regulation, edited by R. Hamlish, FAO Fisheries Reports No. 5, 566 pp., illus., processed, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962. Working papers and record of discussions of an FAO Expert Meeting on

the Economic Effects of Fishery Regulation, Ottawa, Canada, June 12-17, 1961. This meeting, in which economists, biologists, and administrators participated, was organized to take up discussions of the economic effects of fishing industry regulation where preceding FAO-sponsored conferences (the Round Table on the Economics of Fisheries in 1956 and the Technical Meeting on Costs and Earnings of Fishing Enterprises in 1958) had left off. Subjects covered include: the economics of regulating fisheries; effects of fishery regulations on the catch of fish; the economic effects of the regulation of the trawl fisheries of Japan; regulation in the North American lobster fishery; license limitation--British Columbia; regulation of the Pacific Coast halibut fishery; and regulation of the South African West Coast shoal fisheries. The appendices include these papers: "On some Aspects of Fishery Conservation Problems," and "Application of Mathematical Programming Techniques to Commercial Fishery Conservation Problems," by A. Zellner; "The Case for Regulations of the Shrimp Fishery of Panama," by L. K. Boerema and J. L. Obarrio; "Effects of Fishery Regulation on the Processing and Marketing of Fishery Products," by W. H. Stolting; and "Great Lakes Commercial Fishing Regulations," by K. D. Brouillard.

FISHING DEVICES:

Relative Selectivity of Freshwater Commercial Fishing Devices Used in Louisiana, by James Davis and Lloyd Posey, 27 pp., illus., processed, Louisiana Wild Life and Fisheries Commission, Baton Rouge, La., 1959.

FISHING LIMITS:

"Foreign Trawlers: Exclusion or Control?" article, World Fishing, vol. 12, no. 3, March 1963, pp. 29-32, illus., printed, single copy 3s. (about 42 U.S. cents). John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

FLORIDA:

The Shallow Water Amphipod Brittle Stars (Echinodermata, Ophiuroidea) of Florida, by Lowell P. Thomas, Contribution No. 425, 71 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 12, no. 4, December 1962, pp. 623-694.) The Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

Some Relationships Between the Infauna of the Level Bottom and the Sediment in South Florida, by J. Kneeland McNulty, Robert C. Work, and Hilary B. Moore, Contribution No. 410, 11 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 12, no. 3, September 1962, pp. 322-332.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

Summary of Florida Commercial Marine Landings, 1961, and an Analysis of the Catch and Effort of Certain Species, by Albert Rosen and Richard K. Robinson, 62-7, 30 pp., illus., printed, Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., 1962.

FOOD AND AGRICULTURE ORGANIZATION:

Indo-Pacific Fisheries Council Proceedings, 9th Session, Karachi, Pakistan, January 6-23, 1961, Section I,

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printed, \$1. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand.

Report of the International Conference on Fish in Nutrition (Washington, D. C., September 19-27, 1961), FAO Fisheries Report No. 1, processed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

Report on the Meeting of an Expert Panel on Fish Meal and Fish Flour for Human Consumption (Washington, D. C., September 28-29, 1961), FAO Fisheries Report No. 4, processed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

Report of the Preparatory Meeting on the Creation of a Consultative Fisheries Body in West Africa, Dakar, Senegal, May 15-20, 1961, printed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

Requirements and Improvements of Fishery Statistics in the North Atlantic Region, edited by B. B. Parrish, FAO Fisheries Report No. 3, processed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962. Report based on documents of the Expert Meeting on Fishery Statistics in the North Atlantic Area, Edinburgh, Scotland, September 22-29, 1959.

Research Vessel Data, Edition I (Prepared for Research Vessel Forum, September 18-30, 1961, Tokyo, Japan), processed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Informe al Gobierno de Chile sobre Mejoramiento de la Pesca Industrial y de la Comercialización del Pescado (Report to the Government of Chile on Improvements of the Industrial Fishery and Commercialization of the Edible Fish Landed in Chilean Waters), by A. Fernandez y Fernandez, FAO Report No. 1208, 132 pp., illus., 1960.

FOREIGN TRADE:

Comprehensive Export Schedule (and supplementary Current Export Bulletins), printed, \$6 domestic and \$7.50 foreign for subscription year April 1, 1963 to March 31, 1964. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., April 1, 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A compilation of official regulations and policies governing the export licensing of commodities and technical data.

FOSSILS:

In Prehistoric Seas, by Carroll Lane Fenton and Mildred Adams Fenton, 127 pp., illus., printed, \$2.95. Doubleday and Co., 575 Madison Ave., New York 22, N. Y., 1963.

FREEZING:

"Le Developpement des Applications du Froid en France dans le Domaine de la Pêche en 1962" (Developments and Application of Freezing in the French Fishing Industry in 1962), by M. Benezit, article, La Pêche Maritime, vol. 42, no. 1019, February 1963, pp. 101-103, illus., printed in French, single copy 11 NF (about US\$2.25), Les Editions Maritimes, 190 Boulevard Haussmann, Paris 8, France.

GEAR:

CoNetco Commercial Fishing Gear Manual, by Vincent A. Plancich, vol. 1, 29 pp., illus., printed, \$2.50. Consolidated Net and Twine Co., Inc. Fishermen's Terminal, Seattle 99, Wash., 1961.

GHANA:

Report of the Fisheries Division, Ministry of Agriculture, 1960, 35 pp., printed, 5s. (about 70 U.S. cents). Government Printing Department (Publications Branch), Accra, Ghana, 1962. Covers operations and developments in Ghana's sea and fresh-water fisheries, training activities, fisheries statistics, foreign trade in fish, marketing, cold-storage facilities, market surveys, promotion campaigns, and research. Includes statistical tables showing motor fishing vessels and canoes, marine fish production, trawler catch analyses, line-fishing catch analyses, sardinella catch, fresh-water fish catch fishery products imports, and market survey results.

GILL NETS:

The Gill Net, Its Use for Catching Ground Fish, by Alexander Marcotte, 58 pp., illus., processed. (Translated from the French Cahiers d'Information, no. 12.) Station de Biologie Marine de Grande-Rivière, Ministère de la Chasse et des Pêcheries, Province de Quebec, Quebec, Canada, 1962.

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Scandinavian Fishing Year-Book, 1962-63 (The European Fishing Handbook), edited by Jorgen Frimodt, 600 pp., illus., printed, \$6. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y., 1963. The fifth edition of this reference book for those who produce, market, and buy fish has recently been issued in an expanded form, especially with regard to statistics, lists of importers and exporters, and international coverage.

While the greatest amount of detailed information relates to European countries, there also are lists of importers and exporters for Australia and for numerous countries in Africa, Asia, and North, South, and Central America. For example, the United States section has been expanded from 3 to 18 pages. Sections on Belgium, Denmark and the Faroe Islands, Finland, France, West Germany, Iceland, Netherlands, Norway, Sweden, and the United Kingdom contain catch statistics; a register of fishing vessels; lists of shipbuilders, gear manufacturers, and fish meal plants; and other information. Also included are international fisheries statistics compiled by the Food and Agriculture Organization; information on other European countries; and a herring atlas.



SHARKS GET THE NEEDLE

Two Australian skin divers have perfected a hypodermic needle which is recessed in a rod shot from a conventional spear gun. Upon impact, the needle is forced into the shark, injecting a lethal dose of strychnine nitrate. The weapon kills in less than thirty seconds. (Sea Frontiers, May 1963.)



Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

Sr. Compositor: Alma Greene

Jr. Compositors: Donna K. Wallace and Marjorie McGlone

* * * * *

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SEAFOOD BARBECUE

With summer here, it's cook-out time again. If you are planning a backyard barbecue, a picnic, or a beach party, here's an outdoor fish cookery tip from the home economists of the U. S. Bureau of Commercial Fisheries: "Barbecued Shrimp Kabobs."

To round out your outdoor seafood barbecue, wrap potatoes and your favorite vegetables separately in heavy-duty foil and cook them on the barbecue grill, right along with the fish or shellfish. The final touch--a cool, refreshing beverage.

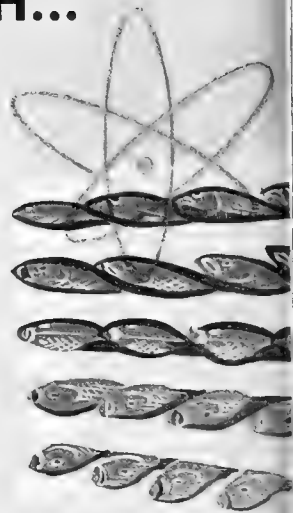


BARBECUED SHRIMP KABOBS

$\frac{3}{4}$ POUND COOKED SHRIMP, FRESH OR FROZEN	$\frac{1}{4}$ CUP SOY SAUCE
12 SLICES BACON	$\frac{1}{4}$ CUP SALAD OIL
1 CAN ($13\frac{1}{2}$ OUNCES) PINEAPPLE CHUNKS, DRAINED	$\frac{1}{4}$ CUP LEMON JUICE
1 CAN (4 OUNCES) BUTTON MUSHROOMS, DRAINED	$\frac{1}{4}$ CUP CHOPPED PARSLEY
	$\frac{1}{2}$ TEASPOON SALT
	DASH PEPPER

Thaw frozen cooked shrimp. Fry bacon slowly until cooked but not crisp. Cut each slice in half. Using long skewers, alternate shrimp, pineapple, mushrooms, and bacon until skewers are filled. Combine soy sauce, salad oil, lemon juice, parsley, salt, and pepper. Brush kabobs generously with sauce and place on preheated barbecue grill about 4 inches from moderately hot coals. Broil 3 minutes, turn and brush with sauce. Broil 3 minutes longer or until lightly browned. Serves 6.

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